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PATENTS

March 19, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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UNITED STATES PATENT AND TRADEMARK OFFICE

March 19, 1985 Volume 1052 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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LIBRARIES

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MAY 15 1985

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	690.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	64.00
Designation fee for 11th and subsequent designations	no charge

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Dec. 24, 1984.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Mar. 16, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,319,361 through 4,320,536

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,167,662, Re. S.N. 667,917, Filed Nov. 2, 1984, Cl. 219/121.L, METHODS AND APPARATUS FOR CUTTING AND WELDING, William M. Steen, Owner of Record: *National Research Development Corp., London, SWL England,* Attorney or Agent: Norman F. Oblon, et al., Ex. Gp.: 213

4,250,338, Re. S.N. 684,776, Filed Dec. 21, 1984, Cl. 568/343, BRIDGED KETONES AND PROCESS FOR PREPARING SAME, Mark A. Sprecker, et al., Owner of Record: *International Flavors & Fragrances, New York, N.Y.,* Attorney or Agent: Arthur L. Liberman, et al., Ex. Gp.: 126

4,275,212, Re. S.N. 689,194, Filed Jan. 7, 1985, Cl. 546/290, METHOD OF PREPARING PYRIDINYL-OXYPHENOLS AND DERIVATIVES, Jon A. Orvik, Owner of Record: *Dow Chemical Co., Midland, Mich.,* Attorney or Agent: Richard G. Waterman, et al., Ex. Gp.: 121

4,367,303, Re. S.N. 687,787, Filed Dec. 31, 1984, Cl. 524/107, SOLUTIONS FOR STABILIZING THERMOPLASTIC POLYCARBONATES, Erich Eimers, et al., Owner of Record: *Bayer Aktiengesellschaft Leverkusen, Germany,* Attorney or Agent: Gene Harsh, et al., Ex. Gp.: 153

4,367,701, Re. S.N. 690,713, Filed Jan. 11, 1985, Cl. 123/090.55, ACTING VALVE GEAR, Stephen M. Buente, Owner of Record: *Eaton Corp., Cleveland, Ohio,* Attorney or Agent: Roger A. Johnston, Ex. Gp.: 342

4,383,525, Re. S.N. 615,439, Filed May 30, 1984, Cl. 128/79, IMPLANTABLE PENILE PROSTHETIC CYLINDER WITH INCLUSIVE FLUID RESERVOIR, F. Brantley Scott, Owner of Record: *American Medical Systems, Inc., St. Louis Park, Minn.,* Attorney or Agent: John F. Lynch, et al., Ex. Gp.: 336

4,383,525, Re. S.N. 615,441, Filed May 30, 1984, Cl. 128/79, IMPLANTABLE PENILE PROSTHETIC CYLINDER WITH INCLUSIVE FLUID RESERVOIR, F. Brantley Scott, et al., Owner of Record: *American Medical Systems, Inc., St. Louis Park, Minn.,* Attorney or Agent: Michael L. Lynch, Ex. Gp.: 336

4,409,145, Re. S.N. 690,675, Filed Jan. 11, 1985, Cl. 260/239, PROCESS FOR PREPARING 4-PHENYL-1,3-BENZODIAZEPINES, Lawrence L. Martin, et al., Owner of Record: *Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.,* Attorney or Agent: William F. Lawrence, Ex. Gp.: 122

4,421,768, Re. S.N. 684,885, Filed Dec. 21, 1984, Cl. 424/325, FLUORINATED DIAMINO-HEPTENE AND HEPTYNE DERIVATIVES, Patrick Casara, et al., Owner of Record: *Merrell Toraude et Compagnie, Strasbourg, France,* Attorney or Agent: Stephen L. Nesbitt, et al., Ex. Gp.: 125

4,423,073, Re. S.N. 685,190, Filed Dec. 20, 1984, Cl. 424/314, FLUORINATED DIAMINOPENTENE DERIVATIVES, Fritz Gerhart, et al., Owner of Record: *Merrell Toraude et Compagnie, Strasbourg, France,* Attorney or Agent: Stephen L. Nesbitt, et al., Ex. Gp.: 126

4,433,727, Re. S.N. 689,346, Filed Jan. 7, 1985, Cl. 166/252, OIL RECOVERY PROCESS AND SYSTEM, Perry A. Argabright, et al., Owner of Record: *Marathon Oil Co., Findlay, Ohio,* Attorney or Agent: Jack L. Hummel, et al., Ex. Gp.: 356

4,479,813, Re. S.N. 689,330, Filed Jan. 7, 1985, Cl. 55/137, ELECTROSTATIC PRECIPITATOR CONSTRUCTION HAVING LADDER BAR SPACERS, John A. Jonelis, Owner of Record: *Inventor,* Attorney or Agent: Anthony S. Zummer, et al., Ex. Gp.: 135

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Des. 269,745, Reexam. No. 90/000,721, Requested: Feb. 11, 1985, Cl. D6/381, SETTEE, Stapleton Long, Owner of Record: *The Berkline Corp., Morristown, Tenn.,* Attorney or Agent: David D. Kaufman, Ex. Gp.: 290, Requester: Benchcraft, Inc., Blue Mountain, Miss.

3,564,463, Reexam. No. 90/000,720, Requested: Feb. 7, 1985, Cl. 333/191, MONOLITHIC PIEZOELECTRIC FILTER HAVING MASS LOADED ELECTRODES FOR RESONATION REGIONS ACOUSTICALLY COUPLED TOGETHER, William D. Beaver, et al., Owner of Record: *AT & T Technologies, Inc., Murray Hill, N.J.,* Attorney or Agent: Seymour E. Hollander, Ex. Gp.: 252, Requester: Darby & Darby P.C., New York, N.Y.

3,810,515, Reexam. No. 90/000,717, Requested: Jan. 25, 1985, Cl. 180/1VG, WALL CLIMBING DEVICE, Ben Ingro, Owner of Record: *Ben Ingro, Melrose Park, Ill.,* Attorney or Agent: V. M. Lund, Ex. Gp.: 310, Requester: Tyco Ind., Inc., Morristown, N.J.

3,951,033, Reexam. No. 90/000,719, Requested: Feb. 8, 1985, Cl. 411/468, CONNECTOR PLATE, Walter G. Moehlenpah, Owner of Record: *Moehlenpah Ind., Inc., Creve Coeur, Mo.,* Attorney or Agent: Michael E. Godar, Ex. Gp.: 350, Requester: Owner

Marks Published for Opposition

The Apr. issues of the Official Gazette (Trademark Section) will present marks published for opposition in two separate sections.

Each section will contain both multiple class and single class applications. The first section will be printed at the beginning of the Official Gazette and the second section will be printed at the end of the Official Gazette, after the Index of Registrants.

The second section will be numbered separately from the first section, and each page will bear the notation Ap.

MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Jan. 10, 1985.

PATENT NOTICES

Certificates of Correction for the Week of Mar. 19, 1985

Re. 31,652	4,416,378	4,453,323	4,464,825
D. 274,037	4,416,691	4,453,584	4,465,805
D. 276,130	4,418,700	4,454,248	4,465,882
3,858,645	4,419,115	4,454,249	4,466,163
3,904,361	4,419,423	4,454,525	4,466,564
3,947,249	4,420,080	4,455,317	4,466,882
4,235,141	4,420,507	4,455,822	4,466,932
4,239,699	4,421,173	4,456,168	4,466,984
4,251,664	4,422,007	4,456,392	4,467,082
4,274,893	4,425,291	4,456,400	4,467,394
4,284,568	4,425,892	4,456,757	4,468,374
4,306,913	4,426,020	4,456,825	4,468,437
4,323,189	4,426,707	4,457,238	4,468,478
4,328,616	4,428,979	4,457,420	4,468,837
4,329,251	4,429,300	4,457,590	4,468,856
4,331,677	4,431,973	4,457,748	4,469,604
4,354,360	4,432,059	4,457,980	4,470,260
4,355,402	4,432,618	4,457,981	4,470,632
4,360,267	4,432,881	4,458,134	4,470,716
4,360,625	4,434,281	4,458,663	4,471,571
4,367,545	4,435,402	4,458,692	4,471,994
4,369,298	4,437,934	4,458,700	4,472,470
4,371,752	4,438,032	4,458,785	4,472,576
4,372,779	4,438,114	4,458,844	4,472,828
4,375,729	4,438,915	4,458,876	4,473,007
4,376,357	4,440,447	4,459,002	4,473,041
4,379,929	4,441,389	4,459,051	4,473,744
4,380,165	4,441,569	4,459,097	4,473,940
4,387,090	4,441,579	4,459,174	4,474,189
4,387,343	4,441,977	4,459,248	4,474,302
4,390,023	4,443,161	4,460,276	4,474,365
4,394,520	4,443,337	4,460,526	4,474,451
4,394,735	4,444,944	4,460,712	4,474,486
4,395,481	4,445,401	4,460,713	4,474,509
4,398,416	4,445,473	4,460,870	4,475,207
4,399,058	4,446,067	4,461,129	4,475,810
4,399,555	4,446,384	4,461,412	4,478,940
4,400,252	4,446,441	4,462,077	4,479,317
4,400,559	4,447,284	4,462,197	4,479,456
4,402,874	4,448,125	4,462,253	4,479,639
4,405,727	4,450,188	4,462,446	4,480,231
4,406,022	4,450,899	4,462,710	4,480,233
4,407,018	4,451,138	4,462,797	4,480,352
4,409,132	4,451,547	4,463,281	4,480,576
4,409,846	4,452,894	4,464,430	4,480,936
4,411,072	4,452,907	4,464,434	4,481,042
4,411,401	4,452,908	4,464,714	4,481,558

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte. Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 2, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-25-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-05-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	8-01-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	9-30-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	3-07-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	7-19-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	10-25-68
DESIGN, GROUP 290—K. L. CAGE, Director	9-17-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	4-17-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	3-19-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-29-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	12-21-81
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-15-82

Expiration of patents: The patents within the range of numbers indicated below expire during February 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,366,970 to 3,371,350, inclusive

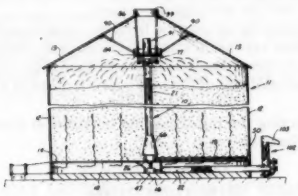
Plant Patents . . . . . Numbers 2,784 to 2,793 inclusive

REEXAMINATIONS

MARCH 19, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,765,548 (311th)
SWEEP AUGER STRUCTURE
Charles C. Shivvers, Corydon, Iowa 50060
Reexamination Request No. 90/000,364, Apr. 27, 1983.
Reexamination Certificate for Patent No. 3,765,548, issued Oct. 16, 1973, Ser. No. 81,163, Oct. 15, 1970.
Division of Ser. No. 638,257, May 15, 1967, Pat. No. 3,563,339.
Int. Cl.[3] B65G *65/46*
U.S. Cl. 414—310



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **2** is confirmed.

Claim **1** was previously disclaimed.

2. Apparatus for moving a horizontal layer of uniform thickness of a free flowing granular material along the bottom wall of a circular storage bin toward the center of the bin comprising:

a. a sweep auger unenclosed over the full length thereof extended radially of the bin and rotatable horizontally of said bottom wall about a vertical axis located centrally of the bin;

b. said sweep auger having a shaft of constant diameter and a flighting with transverse cross sections of varying areas such that as the sweep auger is horizontally rotated on the bin floor the volume of a first axially extended auger section of a given length is substantially equal to the volume of a next adjacent outer axially extended auger section of a given length plus a volume equal to the volume of grain to be picked up by the first auger section, whereby a horizontal layer of grain of uniform thickness is moved toward the center of the bin during each revolution of horizontal rotation of the auger.

B1 4,055,966 (312th)
TORQUE TRANSMISSION COUPLING
Walter A. Fredericks, Warren, Pa., assignor to Rexnord, Inc., Milwaukee, Wis.
Reexamination Request No. 90/000,447, Sep. 19, 1983.
Reexamination Certificate for Patent No. 4,055,966, issued Nov. 1, 1977, Ser. No. 621,450, Oct. 10, 1975.
Int. Cl.[3] F16D *3/78*
U.S. Cl. 464—99

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–3, 5–8, 10–34** and **36–46** are cancelled.

Claims **4, 9,** and **35** are determined to be patentable as amended.

New claims **47–56** are added and determined to be patentable.

4. A coupling [as recited in claim **3** wherein] *for transmitting rotary power, comprising:*

a. [said first fastening members are axially hollow and] *a plurality of flexible laminar elements;*

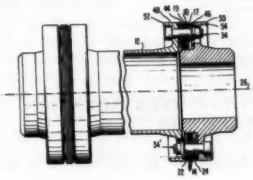
b. *first means for holding said laminar elements in facing relationship, thereby creating a coupling flexing element having a coupling axis and two axial faces, said first means comprising:*

i. a plurality of holes passing through said coupling flexing element in the direction of its coupling axis;

ii. a plurality of first fastening members each of which is axially hollow and sized to fit tightly inside one of said plurality of holes in said coupling flexing element and to pass through said coupling flexing element;

iii. a plurality of first nuts one of which is mounted on or integral with each of said plurality of first fastening members and in abutting relationship with a first axial face of said coupling flexing element; and

iv. a plurality of second nuts one of which is mounted on or integral with each of said plurality of first fastening members and in abutting relationship with the second axial face of said coupling flexing element;



c. a first pilot ring having at least one precision-finished radially symmetric surface for aligning said coupling flexing element with a first hub;

d. second means for affixing said first pilot ring to a first axial face of said coupling flexing element such that the axis of the precision-finished radially symmetric surface is coincident with the coupling axis, said second means comprising:

i. a plurality of holes passing through said first pilot ring in the direction of its axis and in locations corresponding to the locations of said holes in said coupling flexing element; and

ii. a press fit between said first fastening members and said holes in said first pilot ring;

e. said first hub being integral with or adapted to be connected to a shaft for the transmission of rotary power and having at least one precision-finished radially symmetric surface the axis of which is at least approximately coincident with the coupling axis and which is dimensioned to complement the precision-finished radially symmetric surface on said first pilot ring; and

f. third means for mounting said coupling flexing element on said first hub, wherein said third means comprises:

i. a plurality of holes passing through said first hub in the direction of its axis and in locations corresponding to the locations of holes in said coupling flexing element;

ii. a plurality of second fastening members each of which is sized to fit tightly inside the axial hollow in one of said

first fastening members and to pass through said first fastening member and said first hub;

iii. a plurality of third nuts one of which is mounted on or integral with each of said plurality of second fastening members and in abutting relationship with the surface of said first hub on the side thereof opposite to said coupling flexing element; and

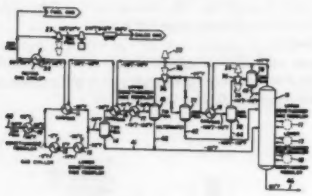
iv. a plurality of fourth nuts one of which is mounted on or integral with each of said plurality of second fastening members and in abutting relationship with the one of said first and second nuts furthest removed from said first hub on the side of said nut furthest removed from said first hub.

B1 4,061,481 (313th)

NATURAL GAS PROCESSING

Roy E. Campbell; John B. Lawrence, and Ronald R. Tonne, all of Midland, Tex., assignors to The Ortloff Corporation, Midland, Tex.

Reexamination Request No. 90/000,077, Sep. 30, 1981.
Reexamination Certificate for Patent No. 4,061,481, issued Dec. 6, 1977, Ser. No. 723,513, Sep. 15, 1976.
Continuation of Ser. No. 516,993, Oct. 22, 1974, abandoned.
Int. Cl.[3] F25J *3/02*
U.S. Cl. 62—29



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2**, and **10** are determined to be patentable as amended.

Claims **3–9**, dependent on an amended claim, are determined to be patentable.

New claim **11** is added and determined to be patentable.

1. In a process for obtaining a liquified fraction from a main stream of gas containing hydrocarbons selected from the group consisting of natural gas, refinery gas streams, and synthetic gas streams obtained from coal, crude oil, naphtha, oil shale, tar sands, and lignite which comprises the steps of

a. removing carbon dioxide, sulfur-containing gases, and other undesirable contaminants;

b. dehydrating the gas stream;

c. expanding said gas stream to a pressure lower than the previously existing pressure while extracting energy from the gas to provide a stream comprising gas and liquid portions; and

d. separating the resulting cold stream *in a demethanizer* into residue gas and liquid portions, the improvement consisting in the steps of:

(1) expanding said gas stream in step (c) in at least two separate stages, each expansion stage being conducted at pressure-temperature conditions which cause hydrocarbons to condense;

(2) directing the gas stream flowing from the first of said expansion stages to a condensed liquid separator where condensed liquid is separated and carried to *said* **[**a**]** demethanizer *and supplied thereto at an intermediate feed position;*

(3) directing the gas portion of the stream after separation in step (2) above into two vapor streams for further cooling, one of said streams flowing in heat exchange relationship with residue gas of lower temperature and the other of said streams flowing in heat exchange relationship with demethanizer liquid of lower temperature;

(4) recombining the thus-cooled streams;

(5) separating the liquid condensed by said further cooling step;

(6) carrying the condensed liquid to *said* **[**a**]** demethanizer;

(7) directing the gas portion of the stream obtained in (5) above to the next expansion stage;

(8) separating the stream leaving the said next expansion stage into gas and liquid portions;

(9) directing the gas portion from the separation following said next expansion stage, together with discharge gas from the demethanizer, into heat exchange relationship with at least one of the two vapor streams in (3) above; and

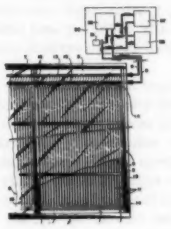
(10) directing the liquid portion obtained in (8) above to demethanizer.

B1 4,112,921 (314th)

METHOD AND SYSTEM FOR UTILIZING A FLEXIBLE TUBING SOLAR COLLECTOR

Calvin D. MacCracken, Englewood, N.J., assignor to Bio-Energy Systems, Inc., Ellenville, N.Y.

Reexamination Request No. 90/000,292, Nov. 22, 1982.
Reexamination Certificate for Patent No. 4,112,921, issued Sep. 12, 1978, Ser. No. 846,112, Oct. 27, 1977.
Continuation-in-part of Ser. No. 790,484, Apr. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 692,887, Jun. 4, 1976, abandoned.
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—448



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–21** and **25–29** is confirmed.

Claims **22–24** are cancelled.

1. The method of transferring heat from the radiant energy of the sun to a recirculating liquid system comprising the steps of:

a. laying lightweight insulating material on a surface receiving heat from the sun,

b. covering the exposed surface of said insulating material with a coating of mastic adhesive,

c. laying in the mastic coating a mat consisting of multiple lengths of closely-spaced, parallel black flexible synthetic tubing members running lengthwise in a grid pattern by

securing means so that the mat length is many times greater than its width,

d. connecting adjacent pairs of first ends of said tubing members to each other at one end of said mat by means of U-shaped conduit pieces,

e. providing supply and return headers extending across the other end of said mat and connecting said supply and return headers alternately to the second ends of said tubing members with the direction of flow of the circulating liquid being opposite in neighboring tubing members in the mat,

f. forming a raised perimeter of insulating material enclosing said mat on all four sides,

g. attaching a cover sheet of translucent solar energy transmitting material to said raised perimeter for creating an enclosed air space above said mat,

h. covering the exposed surfaces of the perimeter insulating material with watertight adhesive,

i. providing pipes leading to and from a recirculating pumped heat utilizing system and

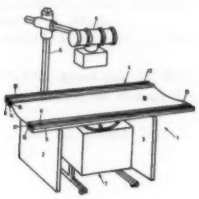
j. connecting the supply and return headers to the supply and return pipes.

B1 4,146,793 (315th)

X-RAY DEVICES USING EPOXY RESINS STRENGTHENED WITH CARBONIC FIBROUS MATERIAL

Lennart Bergstrom, Taby, and Hans E. Warden, Upplands Vasby, both of Sweden, assignors to Siemens AG, Munich, Fed. Rep. of Germany

Reexamination Request No. 90/000,505, Feb. 15, 1984.
Reexamination Certificate for Patent No. 4,146,793, issued Mar. 27, 1979, Ser. No. 675,785, Apr. 12, 1976.
Continuation-in-part of Ser. No. 522,229, Nov. 8, 1974, abandoned, which is a division of Ser. No. 382,013, Jul. 23, 1973, abandoned.
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1972, 2236942
Int. Cl.[3] G03B *41/16*
U.S. Cl. 378—161



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–13** is confirmed.

New claims **14** and **15** are added and determined to be patentable.

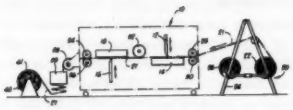
1. For the transmission of X-rays in medical X-ray examination and therapy devices, the use of carbon fiber tissue embedded in epoxy synthetic resin matrices for the patients table top, for the side of the casing of the X-ray image-intensifier directed toward the source of the X-rays, for the side of the casing of the X-ray spot-film device directed toward the source of the X-rays and for the sides of cassettes directed toward the source of the X-rays.

B1 4,270,911 (316th)

METHOD AND SYSTEM FOR PROVIDING ELONGATED Z-FOLD COPY PAPER

Thomas A. McNew, Oklahoma City, Okla., assignor to Digital Magnetic Systems, Inc., Oklahoma City, Okla.

Reexamination Request No. 90/000,139, Jan. 21, 1982.
Reexamination Certificate for Patent No. 4,270,911, issued Jun. 2, 1981, Ser. No. 104,445, Dec. 17, 1979.
Filed Jan. 21, 1982, Ser. No. 104,445
Int. Cl.[3] B65H *45/00, 45/20*
U.S. Cl. 493—410



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **7** and **8** is confirmed.

Claims **1**, **9** and **10** are determined to be patentable as amended.

Claims **2–6** and **11**, dependent on an amended claim, are determined to be patentable.

New claims **12–19** are added and determined to be patentable.

10. The method of making an improved roll of an elongated sheet of copy paper comprising:

forming a plurality of longitudinally spaced, transversely extending score lines in the sheet prior to rolling the sheet, *wherein each of said score lines is formed by a plurality of transversely aligned, spaced perforations;*

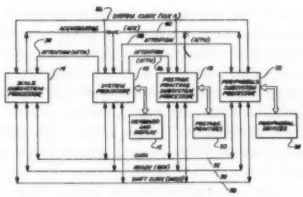
fan-folding the sheet by alternately folding the sheet in first one direction, and then the opposite direction, along the several score lines at a time prior to rolling the sheet; then rolling the scored and folded paper into a roll.

B1 4,271,470 (317th)

SERIAL DATA BUS FOR USE IN A MULTIPROCESSOR PARCEL POSTAGE METERING SYSTEM

Daniel F. Dlugos, Huntington, Conn., and Donald D. Harenberg, Placentia, Calif., assignors to Pitney Bowes Inc., Stamford, Conn. and Rockwell Intl. Corp., El Segundo, Calif.

Reexamination Request No. 90/000,518, Mar. 2, 1984.
Reexamination Certificate for Patent No. 4,271,470, issued Jun. 2, 1981, Ser. No. 13,757, Feb. 21, 1979.
Int. Cl.[3] G06F *15/20;* **G06G** *19/40*
U.S. Cl. 364—466



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–3** is confirmed.

1. For controlling the transfer of data in a multiprocessor postage metering system including a system processor, a scale subsystem processor for providing scale weight and status data and a postage printing system processor for accepting postage printer setting data and for providing printer status data, a data communications system comprising:

attention lines connecting the system processor to the scale subsystem processor and the postage printer subsystem processor for enabling the system processor to initiate communications with a selected one of the subsystem processors by transmission of an attention signal to the selected processor;

acknowledgement lines connecting the scale subsystem processor and the postage printer system processor to the system processor to enable a selected one of the subsystem processors to acknowledge receipt of an attention signal from said system processor;

ready lines connecting the scale subsystem processor, and the postage printer subsystem processor to the system processor for conditioning a selected processor to accept data transmitted from another selected processor; and

a serial data bus common to all of the processors in the system for carrying data between communicating processors.

REISSUES

MARCH 19, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,849

POROUS MEDIA TO SEPARATE GASES LIQUID DROPLETS AND/OR SOLID PARTICLES FROM GASES OR VAPORS AND COALESCE ENTRAINED DROPLETS

Max Klein, 46 Queen Anne Dr., Shrewsbury, N.J. 07701

Original No. 4,239,516, dated Dec. 16, 1980, Ser. No. 18,472, Mar. 8, 1979. Application for reissue Dec. 8, 1982, Ser. No. 447,784

Int. Cl.³ B01D *39/16*

U.S. Cl. 55—389 **32 Claims**

21. A fluid-permeable gas-vapor treating mat which comprises a sheet or elongated web formed from a mixture of:

(a) glass fibers from 6.35 millimeters long to below a length at which said fibers are prone to roping, and from 3 to 12 microns in diameter;

(b) micro-bits of a flexible foamed polyurethane which are in the form of tripodal particles having generally uneven length legs, said particles comprising broken and inter-connected strand portions from adjacent cells of said flexible foamed polyurethane, said strand portions being substantially free of intact cell windows and having hook-like projections, indentations and flutes extending therefrom, said hook-like projections, indentations and flutes having been formed by the destruction of the cell windows of said flexible foam, said micro-bits comprising from about 2 to about 50% by weight of the finished mat; and

(c) a binding agent selected from (a) a compatible organic binder insoluble in cold water and soluble in hot water and inert to the glass fibers, the micro-bits and any other mat constituent, or (b) a cobeat of cotton fibers, and any of said micro-bits, said binding agent being distributed throughout said mat, and comprising from about 2% to about 10% by weight of the finished mat when the organic binder (a) is used, or from about 5.8% to about 11% by weight of the finished mat when the cobeat (b) is used.

Re. 31,850

SOLID STATE DIGITAL-TO-ANALOG CONVERTER

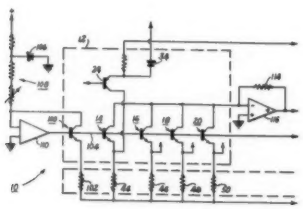
James J. Pastoriza, Lincoln, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Reissued No. Re. 28,633, dated Nov. 25, 1975, Ser. No. 102,854, Dec. 30, 1970.

Original No. 37,470,884, dated Jul. 17, 1973, Ser. No. 524,474, Nov. 18, 1974. Application for reissue Sep. 1, 1981, Ser. No. 298,528

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **6 Claims**



1. An integrated-circuit digital-to-analog converter comprising:

a plurality of transistors on a single monolithic substrate;

switch control means operable by a digital input for selectively activating any of said transistors to pass current therethrough;

circuit means for said transistors to set different levels of current therethrough according to a predetermined weighting pattern such that the sum of the currents produced by the activated transistors represents an analog output in accordance with the required digital-to-analog relationship;

each of said transistors being formed to present in said substrate a respective conductive area proportional to the particular current level assigned thereto in accordance with said weighting pattern, to provide uniform current density in said transistors when activated; and

means for summing the currents flowing through the transistors activated by said switch means so as to provide said analog output;

said substrate being formed with four switching transistors the emitters of which have areas in the ratios of 1:2:4:8.

Re. 31,851

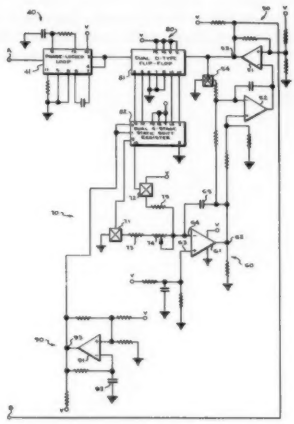
SIGNAL PROCESSING SYSTEM

Wesley J. Bachman, Auburn, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Original No. 4,359,734, dated Nov. 16, 1982, Ser. No. 8,057, Jan. 31, 1979. Continuation of Ser. No. 821,651, Aug. 4, 1977, abandoned. Application for reissue Feb. 24, 1984, Ser. No. 583,352

Int. Cl.³ G01S *7/34, 13/58*

U.S. Cl. 343—8 **28 Claims**



24. In a velocity detecting system in which detector means are utilized for developing an electrical information signal having a characteristic that varies systematically in accordance with the velocity of an object subject to detection, an improved system for processing said electrical velocity information signal, comprising: converter means coupled to said detector means and responsive to said velocity information signal characteristic for developing an oscillatory signal having a value which varies in accordance with said velocity information signal characteristic; filter means, including a phase-locked loop circuit operated with a relatively long time constant to prevent said phase-locked loop circuit from locking, having a variable center value and responsive to said oscillatory signal for filtering all values other than said center value, said center value varying in accordance with said value of said oscillatory signal; whereby a filtered signal comprising the signal passed

by said filter means is relatively noise free and has a value which represents the velocity for the object being detected.

Re. 31,852

DATA TRANSMISSION SYSTEM

Olof Soderblom, Leatherhead, United Kingdom, assignor to Willemijn Houdstermaatschappij BV, Rotterdam, Netherlands

Original No. 4,293,948, dated Oct. 6, 1981, Ser. No. 518,450, Oct. 29, 1974. Continuation of Ser. No. 391,717, Aug. 27, 1973, abandoned, which is a continuation of Ser. No. 773,056, Nov. 4, 1968, abandoned. Application for reissue Jul. 1, 1982, Ser. No. 394,099

Claims priority, application Sweden, Nov. 23, 1967, 16077/67; May 15, 1968, 6589/68

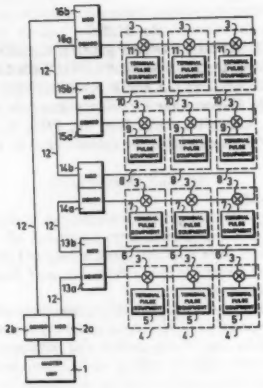
Int. Cl.³ H04J *3/16*

U.S. Cl. 370—90 **33 Claims**

23. A method for controlling the transmission of data over a common loop communications channel from a plurality of terminal units each connected to said loop comprising the steps of:

transmitting on said loop a distinctive signal to initiate data transmission over said loop from those terminal units having data to send;

responding at a terminal unit on said loop which has data to send and which is responsive to said distinctive signal by interrupting said loop at said terminal unit, by placing on said loop the data at said terminal unit, and by thereafter placing on said loop at said terminal unit said distinctive signal at the termination of the transmission of the stored data for similarly effecting the transmission of data from a further terminal unit having data to send,



said transmission of said distinctive signal and of said data always occurring in the same direction around said loop.

PLANT PATENTS

GRANTED MARCH 19, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,418

POMEGRANATE CV. ARMCHAT

Sasszin J. Chater, Camarillo, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jun. 17, 1983, Ser. No. 505,490

Int. Cl.[3] **A01H** *5/03*

U.S. Cl. Plt—33 **1 Claim**

1. A new and distinct variety of fruiting pomegranate, substantially as herein illustrated and described, said variety being characterized in the very sweet quality of its seed pulp even in young immature fruits, the fruits of said variety ripening from mid-summer through late fall.

5,419

CARNATION NAMED LONDRIOKA

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, Antibes, France

Filed Jul. 25, 1983, Ser. No. 517,369

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct carnation variety, substantially as herein shown and described, characterized by the substantially pure white, medium sized blooms which are produced abundantly during each of its recurrent blooming seasons.

5,420

CARNATION NAMED LONBELIT

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, Antibes, France

Filed Jul. 11, 1983, Ser. No. 512,474

Int. Cl.[3] **A01H** *5/00*

U.S. Cl. Plt.—72 **1 Claim**

1. The new and distinct hybrid carnation, substantially as herein shown and described, characterized by the unique form and color of its blooms and its profuse production of flowers during its blooming periods.

PATENTS

GRANTED MAR. 19, 1985

ERRATA

For CLASS	See PATENT NO.
033–357	4,505,054
337–077	4,505,291
384–445	4,505,523
384–615	4,505,524
384–565	4,505,525
494–035	4,505,697
494–040	4,505,698
445–001	4,505,716
044–066	4,505,725
162–009	4,505,775
162–051	4,505,776
162–102	4,505,777
162–135	4,505,778
162–199	4,505,779
534–753	4,505,856
534–768	4,505,857
514–011	4,505,897
514–018	4,505,898
514–008	4,505,899
514–002	4,505,900
514–038	4,505,901
514–112	4,505,904
514–150	4,505,905
514–167	4,505,906
514–210	4,505,907
514–221	4,505,908
514–217	4,505,909
514–026	4,505,910
514–229	4,505,911
514–236	4,505,912
514–183	4,505,913
514–255	4,505,914
514–193	4,505,915
514–314	4,505,916
514–347	4,505,917
514–341	4,505,918
514–340	4,505,919
514–341	4,505,920
514–212	4,505,921
514–383	4,505,922
514–229	4,505,923
514–399	4,505,924

ERRATA—Continued

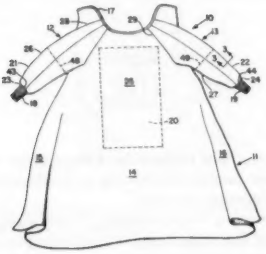
514–405	4,505,925
514–398	4,505,926
514–492	4,505,928
514–413	4,505,927
514–520	4,505,929
514–529	4,505,930
514–594	4,505,931
514–649	4,505,932
514–693	4,505,933
514–762	4,505,934
514–779	4,505,935
526–142	4,506,061
526–211	4,506,062
538–320	4,506,313

PATENTS

GRANTED MARCH 19, 1985

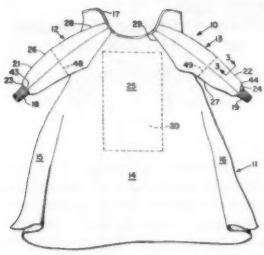
GENERAL AND MECHANICAL

4,504,977
DISPOSABLE ZONED SURGICAL GOWN
Mary K. King; Roger N. White, and Paul E. Gregory, Jr., all of 6300 Center Hill Rd., Cincinnati, Ohio 45224
Filed Apr. 29, 1983, Ser. No. 489,996
Int. Cl.[3] A41B *13/10, 9/00*
U.S. Cl. 2—51 **20 Claims**



1. A surgical gown comprising a body covering portion and sleeves, said body covering portion comprising a base gown material and having a front portion and side portions, said front portion having a central operative region with a water-impermeable material layer covering said central operative region, each of said sleeves having a wrist end, an elbow area, and a shoulder end where said sleeve is attached to said body covering portion, said each sleeve having a zone which extends from a lower end proximate said wrist end of said sleeve to an upper end above said elbow area of said sleeve, said sleeve zone comprising a layer of a base sleeve material and a layer of a water-repellant, air-porous nonwoven fabric web, whereby said web provides enhanced water repellency to said sleeve zone compared to that provided by said base sleeve material alone.

4,504,978
DISPOSABLE SURGICAL GOWN SLEEVE
Paul E. Gregory, Jr., and Roger N. White, both of 6300 Center Hill Rd., Cincinnati, Ohio 45224
Filed Apr. 29, 1983, Ser. No. 490,095
Int. Cl.[3] A41D *27/16*
U.S. Cl. 2—59 **19 Claims**



1. A garment sleeve, said sleeve having a wrist end, an elbow area, and a shoulder end, said sleeve having a zone which extends from a lower end proximate said wrist end of said sleeve to an upper end above said elbow area of said sleeve, said sleeve zone comprising:

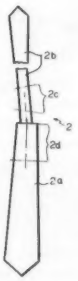
(a) an outer layer of base sleeve material;

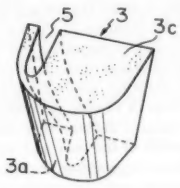
(b) an inner layer of sleeve lining material;

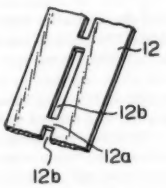
(c) a mid layer of barrier material, said barrier material being a water-repellent, air-porous nonwoven fabric web, said mid layer being encased between said outer and inner layers;

(d) a first bond around said sleeve at said lower end of said sleeve zone, and a second bond around said sleeve at said upper end of said sleeve zone, said first and second bonds bonding said outer and inner layers to one another, said mid layer being excluded from said first and second bonds.

4,504,979
NECKTIE ASSEMBLY
Hironobu Kawamura, Tokyo, Japan, assignor to Kawamura Shouji Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 1, 1983, Ser. No. 500,097
Int. Cl.[3] A41D *25/14*
U.S. Cl. 2—153 **6 Claims**







1. A necktie assembly comprising a tie body consisting of wide and narrow bands that are longitudinally connected to each other, said narrow band having an interlining with a longitudinal slot along at least a portion thereof, and a core body provided with a channel of U-shaped cross section, said tie body being tied around said core in a knot that is formed by longitudinally folding a portion of said narrow band along said slot and inserting said folded portion of said narrow band into said channel so that the longitudinally folded state of said band is maintained by engagement with a wall of said channel, wrapping a midportion of said tie body around said core body

at least once to form a layer on said core body, and inserting a free end of said wide band between said layer and said core body from top to bottom.

4,504,980
SECURITY HAND BAND
Dayton M. Butcher, 220 Cochran Rd., Lexington, Ky. 40502
Filed Sep. 19, 1983, Ser. No. 533,438
Int. Cl.³ A41D *19/00*; A45F *5/02*
U.S. Cl. 2—160 **12 Claims**

1. A security hand band including:

a strip of flexible material for wrapping around either hand of a user in a non-binding relation;

said strip of flexible material having a first opening adjacent one end thereof to initially receive a thumb of the user;

said strip of flexible material having retaining means on its outer side intermediate its ends to retain a protective device or the like adjacent the palm of the hand of the user irrespective of the position of the hand of the user and without any gripping of the protective device by the user to form the sole retention of the protective device on said strip of flexible material, said retaining means being disposed on said strip of flexible material for positioning in the palm of the hand of the user after said first opening has received the thumb of the user and said strip of flexible material has a portion passed around the back of the hand of the user prior to said strip of flexible material being passed over the palm of the hand of the user;

said strip of flexible material having a second opening to receive the thumb of the user after said strip of flexible material has passed over the palm of the hand of the user, said strip of flexible material having said second opening disposed closer to its other end than to its one end;

said strip of flexible material having attaching means to attach its portion beyond said second opening to the portion of said strip of flexible material passed around the back of the hand of the user prior to said strip of flexible material being passed over the palm of the hand of the user;

said strip of material including a pair of substantially parallel, longitudinal edges;

and said attaching means including:

first means disposed adjacent the other end of said strip of flexible material on its inner side adjacent each of said longitudinal edges of said strip of material;

and second means disposed on the outer side of said strip of flexible material between said first opening and said retaining means adjacent each of said longitudinal edges of said strip of material.

4,504,981
INTRAOCULAR LENS
Gerald B. Walman, 7156 N. 3rd Ave., Phoenix, Ariz. 85021
Filed Sep. 28, 1981, Ser. No. 306,326
Int. Cl.³ A61F *1/16*, *1/24*
U.S. Cl. 3—13 **32 Claims**

1. An intraocular lens implant for intracapsular and extracapsular eyes, said implant comprising in combination:

(a) a lens for focusing the light;

(b) a first supporting loop extending in one direction from said lens, said first supporting loop including at least a first pair of fixation points for supporting said lens within the eye;

(c) a second supporting loop extending in a second direction from said lens and in opposed relationship to said first supporting loop, said second supporting loop including at least a second pair of fixation points for supporting said lens within the eye; and

(d) each of said first and second supporting loops including at least one segment for defining at least one of said pair of fixation points, each of said first and second supporting loops including at least a pair of segments, each segment of said pair of segments being generally non-aligned with a radial of said lens and each segment of said pair of segments which extends directly from said lens being oriented generally non-parallel with any ther segment which extends directly from said lens;

whereby, any compressive force applied between two generally opposed ones of said fixation points will result in lateral compression in the plane of the lens rather than anterior or posterior bowing of the affected ones of said segments.

4,504,982
ASPHERIC INTRAOCULAR LENS
Paul O. Burk, Glendora, Calif., assignor to Optical Radiation Corporation, Azusa, Calif.
Filed Aug. 5, 1982, Ser. No. 405,326
Int. Cl.³ A61F *1/16*, *1/24*
U.S. Cl. 3—13 **6 Claims**

1. An intraocular lens for implantation in the human eye comprising a lens having at least one curved surface with a radius of curvature that is longer at the edge than at the apex, wherein the radius of curvature in the area up to 1.5 mm from the apex is constant.

4,504,983
TOILET INSTALLATION

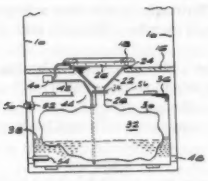
Anthony W. Goodyer, 73 Chelmsford Rd., Durban, Natal, South Africa (4001)

Division of Ser. No. 389,663, Jun. 17, 1982, abandoned. This application Jun. 27, 1984, Ser. No. 625,561

Claims priority, application South Africa, Jun. 22, 1981, 81/4213; Oct. 1, 1981, 81/6796; Jan. 13, 1982, 82/0210; Feb. 16, 1982, 82/0988

Int. Cl.³ E03D *1/00*

U.S. Cl. 4—321 **12 Claims**



1. A toilet which does not require connection to external soil disposal facilities, comprising:

a housing, a soil holding drum removable from the housing and provided with separate compartments for soil and fresh water, with said separate compartments being divided by means of a flexible membrane into a fresh water space and a soil holding space, an opening in a wall of said drum for receiving soil, a toilet bowl supported by said housing, said flexible membrane being in the form of a bag which has a neck integral with said toilet bowl, said bowl being removable from the housing together with said drum, and means for sealing the opening when the drum is full.

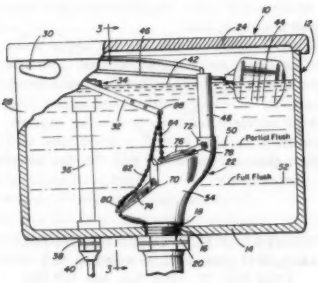
4,504,984
TWO-STAGE TOILET FLUSH VALVE ASSEMBLY

John W. Burns, R.D. #2, Box 159, Summerville, Pa. 15864

Filed Nov. 13, 1981, Ser. No. 321,315

Int. Cl.³ E03D *1/14, 3/12*

U.S. Cl. 4—326 **5 Claims**



1. In a dual volume flushing system having a flush tank, an outlet section through which flushing water is conducted from the tank along a vertical axis, a single valve body connected to said outlet section within the tank, a pair of vertically spaced flap valves pivotally mounted on the valve body and actuating means displaceable in one direction for selectively opening one or both of the flap valves to admit water from the tank into the valve body, the improvement residing in said valve body including valve seat portions supporting flap valves in closed positions at different angles to the vertical axis on opposite sides thereof and a single flush lever pivotally mounted within the tank operatively connected in common to both of the flush valves by the actuating means, an overflow tube connected to the valve body above said flap valves and spaced from the vertical axis opposite the flush lever, said valve body extending transversely of the outlet section and at a general incline to a plane perpendicular to the vertical axis.

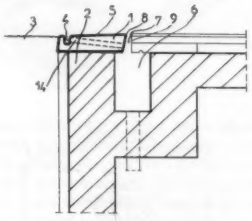
4,504,985
SWIMMING POOL COPING

Philippe De Brossard, Menton, France, assignor to Societe Civile Professionnelle Gazzano & Blais, Menton, France, a part interest

Filed Dec. 14, 1982, Ser. No. 449,685

Int. Cl.³ E04H *3/16, 3/18*

U.S. Cl. 4—506 **4 Claims**



1. Swimming pool coping permitting overflow, the coping being rectilinear and having an upwardly opening overflow channel therein parallel to its length, the coping having an uppermost surface that is flat and imperforate and is inclined upwardly from said channel at a small angle to the horizontal in a direction away from the water's edge, and a plurality of passageways through the coping that are inclined downwardly from the overflow channel in a direction away from the water's edge and that are adapted to empty into a water recovery channel for a swimming pool , said overflow channel being disposed more closely adjacent the water side of the coping than adjacent the side of the coping remote from the water, said channel being defined between two upright side walls, said passageways opening through that one of said side walls which is farther from the water, the uppermost surface of the coping on the water side of the channel being at the same horizontal level as said uppermost surface of the coping immediately on the other side of the channel.

4,504,986
SINK MOUNTING

James A. Vigh, North Olmsted, Ohio, assignor to Stanadyne, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 405,394, Aug. 5, 1982,. This application Jun. 29, 1983, Ser. No. 508,346

Int. Cl.³ E03C *1/18*

U.S. Cl. 4—633 **5 Claims**

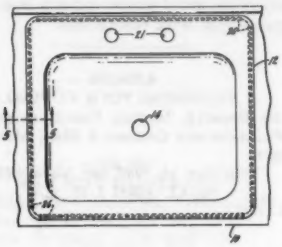
1. A sink mounting for top installation of a sink through a sink top opening including:

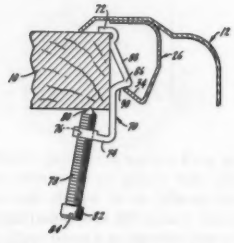
brackets for adjustable mounting to a deck surrounding, at least in part, a sink top opening, said brackets being mountable through the sink top opening, said brackets being mounted at a plurality of spaced locations about the sink top opening and having locking portions thereon which include inwardly-directed projections with a lower locking surface thereon,

each bracket including an upper clip and a lower clip attached thereto, said upper clip having a support portion resting upon the deck adjacent the sink top opening, with the lower clip having means for adjustably fastening it to the underside of the deck adjacent the sink top opening,

a sink having channel means on the underside thereof and adjacent the periphery thereof, said channel means includ-

ing a flexible hook formed to interlock with said bracket locking portion locking surface by extending into locking





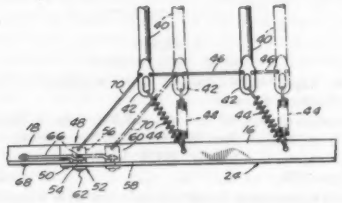
contact thereagainst when the sink is inserted through the sink top opening.

4,504,987

MATTRESS SUPPORT MECHANISM FOR FOLDING SOFA-BED

Melvin P. Spitz, Beverly Hills, Calif., assignor to Bedline Manufacturing Company, Whittier, Calif.

Filed Jan. 25, 1983, Ser. No. 460,959
Int. Cl.³ A47C *17/04*
U.S. Cl. 5—13 **1 Claim**



1. A mattress support mechanism for a folding sofa-bed frame having a plurality of sections including a body section, pivotally interconnected in end-to-end relation for movement into an extended planar position to form a bed, and into a folded position to form a sofa seat, comprising:

(a) a flexible mattress supporting fabric (32) in the frame body section (16) adapted in the extended bed forming position to sag under the weight of an occupant;

(b) means operative in the bed forming position for modulating the flexing movement of the fabric due to the weight of said occupant, comprising:

at least one elongate substantially rigid member (40) extending transversely essentially between the opposite sides of the frame of said body section (16) in underlying relation to said flexible mattress supporting fabric (32);

coiled springs (44) respectively connecting the ends of said rigid member (40) with adjacent side rails (22, 24) of the body section (16), and being operative to bias said rigid member (40) in a direction towards said adjacent flexible mattress supporting fabric (32); and

(c) control means operative in the seat forming position for deactivating said modulating means, comprising:

slide members (52) respectively on said side rails (22, 24) in laterally spaced relation to the attached coiled springs (44);

pull links (70) respectively connecting the adjacent ends of said rigid member (40) with said slide members (52); and

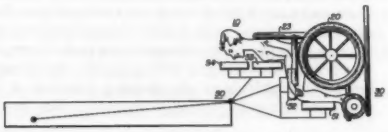
lever members (66) respectively having one end pivoted to the adjacent slide member (52) and its other end pivoted to the adjacent side rail of a frame section (18) pivotally connected with said body section (16).

4,504,988

PATIENT TRANSFER ARRANGEMENT

Gary Deutchman, Marietta, Ga. 30067 1113 Powers Ferry Pl. Apt. H1-6

Filed Jun. 27, 1983, Ser. No. 508,013
Int. Cl.³ A61G *7/10*
U.S. Cl. 5—81 R **18 Claims**



1. A patient transfer arrangement for transferring a patient between seated and substantially prone positions, the patient transfer arrangement comprising: a chair having a back member, a seat member, and a leg member; a segmented table having a base member, an upper body segment, a thigh segment, and a lower leg segment;

chair base means for supporting the chair secured thereto and moving the chair between upright and forwardly inclined positions; and

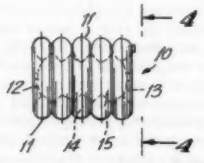
segment drive means for moving the upper body, thigh and lower leg segments of the segmented table whereby, during the motion of the chair between said upright and said substantially inclined position, the upper body segment, the thigh segment, and the lower leg segment maintains substantially parallel spatial relationships with the back member, the seat member, and the leg member of the chair, respectively;

4,504,989

INFLATABLE SUPPORT ARRANGEMENT

Dean I. Maltz, 1011 Hazel Pl., Woodmere, N.Y. 11598

Filed Jun. 27, 1983, Ser. No. 507,968
Int. Cl.³ A47C *27/10, 4/54*
U.S. Cl. 5—455 **20 Claims**



1. An inflatable support arrangement, comprising

first wall means including at least one flexible first wall portion bounding at least one enclosed annular zone and circumferentially completely surrounding a central region;

second wall means including at least two flexible second wall portions having respective peripheries sealingly connected to said first wall means all around said central region to separate the latter from the exterior of the support arrangement;

main one-way inlet valve means for admitting air from said exterior into said central region to inflate the support arrangement, and for preventing the thus admitted air from escaping to said exterior; and

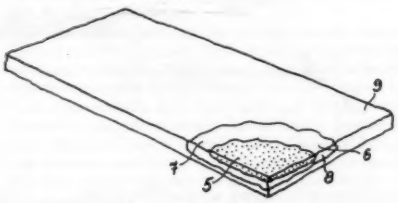
auxiliary one-way inlet valve means interposed between said central region and said annular zone for transferring air from the former into the latter and for preventing the transferred air from returning into said central region so that, in the inflated condition of the support arrangement, the air pressure in said annular zone causes said first wall means to form a relatively rigid, circumferentially complete shape-determining circumferential frame of the support arrangement regardless of the air pressure prevailing in said central region.

4,504,990

FIRE RESISTANT SUPPORT FOR THE HUMAN BODY

John T. Scales, Stanmore; Anthony G. Poole, Leamington Spa; David Wilson, West Bridgeford, and Anthony J. Middleton, Beaconsfield, all of England, assignors to Courtaulds PLC, London, England

Filed Jul. 19, 1982, Ser. No. 399,331
Int. Cl.³ A47C *27/00*
U.S. Cl. 5—459 **5 Claims**



1. A resilient support for the human body comprising,

(a) a resilient supporting block,

(b) cover means closely enclosing said block,

(c) wherein said cover means are fire resistant,

(d) at least that part of said cover means intended to lie between the block and a human being being of stretch material,

(e) said stretch material having a recoverable extension of at least 20 percent in the width direction and at least 10 percent in the length direction measured on a Fryma Extensiometer according to British Standard No. 4294 using a load of 3 kg, whereby said stretch material is able to conform to the adjacent surface of the block when the support is subjected to deformation by a human being and recover sufficiently after extension so as to avoid forming creases or rucks after the block has returned to its undeformed state, said stretch material comprising,

(f) at least 75 percent by weight of cellulosic yarn based on the weight of the fabric and wherein,

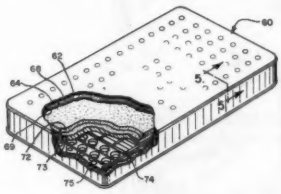
(g) the fabric has a weight, after treatment with flame retardant, of at least 250 g/m^2.

4,504,991

FIRE-RESISTANT MATTRESS AND HIGH STRENGTH FIRE-RETARDANT COMPOSITE

Alvin R. Klancnik, Park Ridge, Ill., assignor to Sealy, Incorporated, Chicago, Ill.

Filed Jun. 7, 1982, Ser. No. 386,101
Int. Cl.³ A47C *5/12, 7/18*
U.S. Cl. 5—459 **10 Claims**



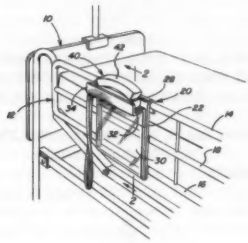
1. In a mattress comprising a cover and a plurality of flammable components, a composite comprising a first layer of a fire-retardant composition bonded to a second layer of a material having a high tensile strength in the directions along its surface, the composite substantially enclosing the flammable components and oriented such that the material having a high tensile strength is disposed adjacent to at least one of the flammable components and the fire-retardant composition is disposed adjacent to the cover.

4,504,992

HOSPITAL BED TELEPHONE HOLDER

Robert G. Herron, and Claudia S. Herron, both of 628 George St., Old Forge, Pa. 18518

Filed Dec. 6, 1982, Ser. No. 447,241
Int. Cl.³ H04M *1/04*; A47B *97/00, 96/06*
U.S. Cl. 5—507 **7 Claims**



1. A phone holder for a hospital bed, said holder comprising a one-piece panel structure including a first upstanding panel section including inner and outer sides and terminating upwardly in an inwardly and downwardly directed first reversely turned hook portion adapted to hook engage over the upper horizontal rail portion of a hospital bed side rail assembly with said inner side abuttingly engaging the outer side of said rail assembly at points spaced vertically therealong said first panel section, the lower end of said first panel section terminating downwardly in an outwardly and upwardly directed second reversely turned panel section spaced slightly outwardly of the outer side of the first panel section, said second panel section terminating upwardly in an out-turned horizontally directed shelf spaced below the upper end of said first panel section, said shelf being adapted to support the base of a telephone between said curb and said upper end of said first panel section, the upper marginal portion of said second panel section and said shelf and curb being yieldingly biased toward the upper marginal portion of the first upstanding panel section for clampingly engaging a telephone base disposed on said shelf

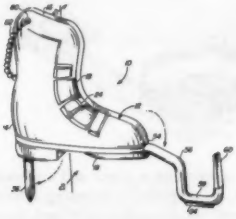
between said curb and the upper marginal edge of said first panel section.

4,504,993

SKIER'S ACCESSORY TOOL

Christopher L. Gamble, 2040 E. Howe, Tempe, Ariz. 85281

Filed Mar. 31, 1983, Ser. No. 480,758
Int. Cl.[3] B25F *1/04*
U.S. Cl. 7—165 5 Claims



1. A skier's accessory tool comprising:

(a) a body defining first and second recesses, said body being in the general configuration of a ski boot having a top edge, rear edge, front edge and sole, said first recess provided along a portion of the body corresponding to the sole of the body and said second recess provided in an area of the body generally extending along the front and top of the body;

(b) a first tool pivotally secured at said first recess having an end configured in a first tool shape; and

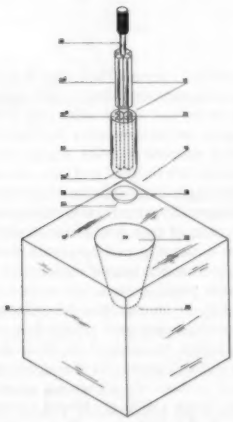
(c) a second tool pivotally secured at said second recess adapted to be moved to an open position extending from said recess, said second tool having an end configured in a second tool shape and having a generally hook-shaped portion.

4,504,994

APPARATUS FOR APPLYING AND WORKING A CLEANSING PREPARATION ON CONTACT LENSES

Calvin M. Johnston, 4440 Central Ave., Apt. #6, Charlotte, N.C. 28205

Filed Jan. 5, 1984, Ser. No. 568,296
Int. Cl.[3] B08B *11/02*
U.S. Cl. 15—104.92 9 Claims



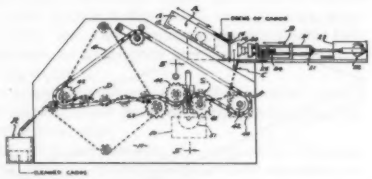
1. Apparatus for applying and working a cleansing preparation on contact lenses of the soft hydrophilic type, the hard hydrophobic type or the like with limited manual handling and manipulation thereof comprising a body having formed therein a recessed area having a surface formed of a material relatively soft and sufficiently abrasive to said contact lenses only for effective surface cleaning thereof without damage thereto and having a concave area configured in substantial conformity to the outward convex surface of said contact lenses for receiving one said contact lens in substantial surface contact with said outward convex surface and handle means including a cleaning head having a surface formed of a material relatively soft and sufficiently abrasive to said contact lenses only for effective surface cleaning thereof without damage thereto and having a convex projecting portion adapted for insertion in said recess of said body and configured in substantial conformity to the inward concave surface of said contact lens for engagement with said one contact lens in substantial surface contact with said inward concave surface thereof, whereby said one contact lens may be cleansed by application of said cleansing preparation to said surface of said concave area and said surface of said convex projecting portion, disposition of said one contact lens in said recessed area with said outward convex surface of said one contact lens on said concave area, insertion of said cleaning head in recessed area with said convex projecting portion in engagement with said inward concave surface of said contact lens, and manipulation of said handle means to apply a working action of said cleansing preparation to said inward and outward surfaces of said one contact lens.

4,504,995

PLAYING CARD CLEANING APPARATUS

John C. Zippwald, Sr., 3950 Las Vegas Blvd., Las Vegas, Nev. 89119

Filed Jan. 17, 1983, Ser. No. 458,611
Int. Cl.[3] B08B *1/02*
U.S. Cl. 15—102 5 Claims



1. A playing card cleaning apparatus including;

separating means sequentially feeding the cards in spaced planar relation disposed forwardly into a processing plane,

scrubbing means comprised of, a first pair of traction rollers pressed together at said processing plane to receive and drive cards therethrough, a pair of scrubbing rollers positioned forward of the first pair of traction rollers and pressed together at said processing plane to receive said cards simultanesouly engaged with the first pair of traction rollers, and a second pair of traction rollers positioned forward of the scrubbing rollers and pressed together at said processing plane to receive said cards simultaneously engaged with the pair of scrubbing rollers,

means positively driving the two pairs of traction rollers forwardly at the same peripheral rate and positively driving the pair of scrubbing rollers forwardly at a lesser peripheral rate than the peripheral rate of the two pairs of traction rollers, whereby a scrubbing action is effected by the pair of scrubbing rollers,

means wetting the scrubbing rollers with a liquid cleaning solution transferred thereby onto opposite sides of the cards and simultaneously squeegeed therefrom,

and drying means extended from the processing plane and

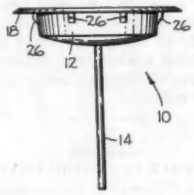
receiving scrubbed cards from the scrubbing means and drying the same.

4,504,996

GARBAGE DISPOSAL UTENSIL

Evelyn J. Loos, Saratoga, Calif., assignor to Stanley M. Weir, Santa Clara, Calif.

Filed May 10, 1982, Ser. No. 376,706
Int. Cl.³ A47L *25/00*
U.S. Cl. 15—105 **2 Claims**



1. The improvement in garbage disposal utensils of the type wherein a circular member defines an upper and lower surface which member serves as a protector and either as a plug or drain, and wherein a handle is secured to the upper surface and a blade is secured to the lower surface of said circular member and wherein said blade extends substantially through a disposal splash back protector to a distance above the disposal garbage grinding blades when the circular member is resting on the disposal splash back protector, the improvement which comprises:

A. a stopper lip formed around the periphery of said circular member adjacent to the upper surface thereof and adapted to extend outwardly to seal the area around the rim of a disposal drain hole when said lip is in contact with the area around the rim;

B. a recess in the upper surface of said circular member;

C. a handle formed in said recess and positioned substantially below said upper surface;

D. flexible lobes formed on the circular member below said lip and extending outwardly from said circular member to contact the opening in a disposal drain hole, whereby the lower extremities of said flexible lobes are adapted to rest on a disposal drain hole rim positioning said lip above the drain hole and when the circular member is pressed down, the lobes are adapted to be pressed inwardly and permit the circular member to move downwardly to move said lip into sealing engagement with said drain hole;

E. a scraper blade mounted on the lower surface of said circular member and extending downwardly therefrom so that it extends substantially through a disposal splash back protector to a distance above the disposal grinding blades when the stopper lip is sealing the area around the rim of a disposal drain hole.

4,504,997

BRUSHING TOOL

Karl M. Weiler, Buck Hill Falls, Pa., assignor to Weiler Brush Company Inc., Cresco, Pa.

Division of Ser. No. 459,289, Jan. 20, 1983, Pat. No. 4,488,760.
This application Apr. 16, 1984, Ser. No. 600,611
Int. Cl.³ A46B *3/00, 13/02*
U.S. Cl. 15—179 **4 Claims**

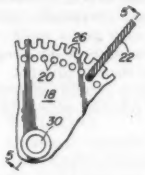
1. A brushing tool comprising:

(a) a circular disc,

(b) the disc having a plurality of circumferentially-disposed perforations proximate the rim of the disc,

(c) wire knots looped through each perforation to form an eye so as to anchor the knot in the perforation,

(d) means for enabling the rim of the disc to receive and laterally support at least a portion of the knots so that the knots are free-standing withoout being supported by side plates and wherein the rim of the disc limits pivotal movement of the knots in the plane of the disc, and



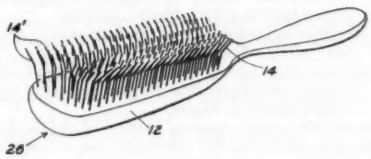
(e) means integral with the disk for coupling the disc to drive means for imparting rotary motion to the disc.

4,504,998

HUMAN HAIR-GROOMING DEVICE

Vera H. Price, 964 Shattuck Ave., Berkeley, Calif. 94707, and Emory Menefee, 5313 Rosalind Ave., Richmond, Calif. 94805

Filed Sep. 24, 1982, Ser. No. 422,865
Int. Cl.³ A46B *9/02*
U.S. Cl. 15—186 **1 Claim**



1. A human hair grooming device comprising a plurality of hair-engaging elements retainably mounted in a base which are aligned in rows along the length and width of the base, each element being characterized as having (1) a rounded end, (2) an overall length of from approximately 1 to 3 cm, (3) a cross sectional width of from approximately 0.3 to 2.0 mm, and (4) a single positional distortion along its axis from approximately 0.5 to 2.5 cm from its point of attachment to said base, wherein the distortions in approximately half of the rows of said hair-engaging elements are oriented oppositely to the distortions in the remaining rows of said hair engaging elements and wherein said base and hair-engaging elements, taken together, are of a sufficient flexibility to allow release of entangled hair before grooming stresses become large enough to cause hair breakage.

4,504,999

BUFFING WHEEL HUB

Charles E. Pedrotte, Warren, Mich., assignor to Cormat, Inc., Roseville, Mich.

Filed Nov. 4, 1983, Ser. No. 548,725
Int. Cl.³ A46B *15/00*
U.S. Cl. 15—230.1 **8 Claims**

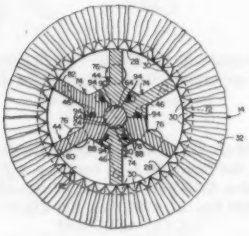
1. In a buffing wheel hub device for mounting a plurality of buffing wheels upon an arbor for rotation by said arbor, said device comprising female and male units secured upon said arbor and having end plates bearing upon said buffing wheels supported axially and in parallel on said units and therebetween, the improved combination comprising

a plurality of radially oriented, spaced apart, axially extending female unit finger members secured to one said end plate on a bolt circle within the bore of said buffing wheels, a plurality of radially oriented, spaced apart, axially extending male unit finger members secured to a second said end plate on a substantially identical bolt circle within the bore of said buffing wheels,

the finger members of one said unit being relatively shorter in length than the finger members of the other said unit to compactly secure the buffing wheels supported thereon between said end plates,

said finger members of both said units having arbor adjacent portions defined by radially inclined surfaces tapering toward each other and a surface therebetween substantially complementary to the peripheral outer surface of said arbor next thereto adjacent,

said finger members of both said units having buffing wheel bore adjacent portions each defined by a radial stem or



body of reduced transverse cross-sectional thickness substantially less than the transverse cross-sectional thickness of said tapered arbor adjacent portions,

said radial stem terminating at its distal edge closely adjacent said buffing wheel bore,

said end plates having openings therethrough for passage of ambient cooling air into said hub and about said buffing wheel supporting fingers,

whereby the axially extending portions of said finger members are relatively free to flex outwardly under centrifugal force generated by rotation of said arbor and more securely grip and drive said buffing wheels rotatably in their buffing operation.

4,505,000

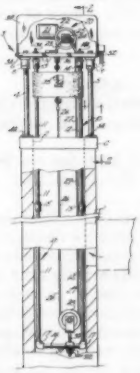
CHIMNEY CLEANING APPARATUS

Burnell G. Boehland, Creswell, and Donald G. Coutts, Eugene, both of Oreg., assignors to Speedy Automatic Chimney Sweep, Inc., Eugene, Oreg.

Continuation-in-part of Ser. No. 580,938, Feb. 16, 1984, abandoned. This application May 3, 1984, Ser. No. 606,533

Int. Cl.[3] **F23J** *3/00*

U.S. Cl. 15—249 **9 Claims**



1. A chimney cleaning apparatus comprising,

a base for supported placement on a chimney,

a support structure carried by said base and extending downwardly therefrom for lengthwise disposition within a chimney,

a brush assembly including a brush, a flexible elongate element attached to said brush,

a first rotatable member carried by said base,

a second rotatable member carried by said support structure adjacent one end thereof, said flexible element entrained about said first rotatable member and said second rotatable member,

reversible motor means carried by said base to impart rotation to said first rotatable member to propel said brush in a rectilinear manner through the chimney, and

a motor circuit in switch controlled circuit with a power source and with said motor to energize same for predetermined periods of motor operation in each direction whereby the brush assembly will dislodge chimney deposits with the brush coming to rest at an elevated position subjacent said base.

4,505,001

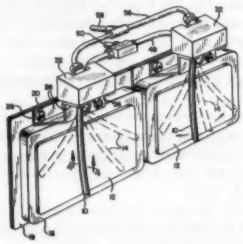
SURFACE CLEANING DEVICE

Gabriel V. Fasolino, Wilsonville, Oreg., assignor to Delbert C. Hewitt, Wilsonville, Oreg.

Filed Feb. 22, 1983, Ser. No. 468,042

Int. Cl.[3] **B60S** *1/10, 1/46*

U.S. Cl. 15—250 A **8 Claims**



1. A cleaning device for the lens surface of vehicle lights having a support frame, said device comprising

(a) support means arranged to be mounted on said light adjacent said lens surface,

(b) a flexible tube having opposite ends,

(c) one end of said tube being secured to said support means for support adjacent said lens surface,

(d) the other end of said tube being open,

(e) said tube being supported in substantially parallel relation with said lens and in overlapping engagement therewith,

(f) and means at the supported end of said tube for admitting pressured fluid whereby upon selected pressured flow of fluid through said tube, said tube whips back and forth in flogging engagement with said surface to beat foreign material off said lens surface.

4,505,002

STRETCHING MECHANISM OF A DEVICE FOR CUTTING SLAUGHTERED POULTRY

Edward J. Tieleman, Broekhuizerweg 8, 6983 BM Doesburg, Netherlands

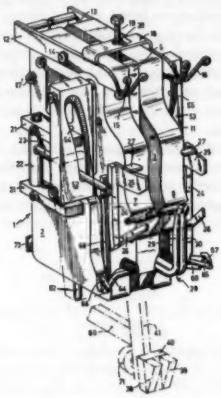
Filed Jan. 6, 1983, Ser. No. 456,180

Int. Cl.[3] **A22C** *21/00*

U.S. Cl. 17—11 **9 Claims**

1. A stretching mechaism for holding a bird in a machine which cuts slaughtered poultry, said mechanism being provided with a support surface for the bird, means for hanging the bird by the legs, means for holding the wings of the bird, and trunk holding means for holding the trunk against the support surface, said trunk holding means including a symmetrical centering fork for engaging the spine of the bird, means

for producing relative movement between the centering fork and the support surface to bring the centering fork into the trunk of a bird on the support surface, guide means for causing said relative movement to follow a path which extends inwardly into the trunk of the bird and toward the support surface, said centering fork being movable to and from an operative end position at which the centering fork engages the spine at the inside of the trunk of the bird.



4,505,003

APPARATUS FOR THE PRODUCTION OF FILLED TUBULAR CASINGS

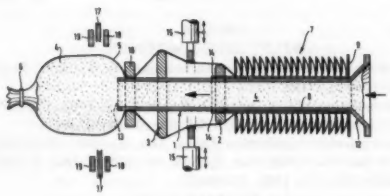
Reinhold Becker, and Wolfgang Michel, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 19, 1983, Ser. No. 486,422

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214673

Int. Cl.³ A22C *11/02*

U.S. Cl. 17—41 **16 Claims**



1. An apparatus for stuffing a shirred tubular casing with a fluid material such as a sausage composition or pieces of ham, said apparatus comprising a stuffing horn **(1)** having an aperture through which the fluid material **(4)** is forced under pressure; a shirred tubular casing **(7)** disposed on the peripheral surface of the stuffing horn **(1)** and having an unshirred portion **(5)** of predetermined inner circumference, a device located on the peripheral surface of said stuffing horn **(1)** and in the interior of said casing **(5)** for smoothing and expanding the tubular casing, said device having a bore **(10, 11)** by means of which it is pushed onto and fastened to said stuffing horn, said device comprising at least two disk-shaped planar bodies **(2, 3)** on the stuffing horn **(1)**, at least one of said planar bodies **(2, 3)** being rotatable in a plane parallel and/or shiftable perpendicular to the longitudinal axis of said stuffing horn, the outer circumference of each of said planar bodies **(2, 3)** being smaller than the inner circumference of the unshirred tubular casing **(5)**, whereby the projection of the cross-sectional surfaces of the planar bodies **(2, 3)** in the direction of the longitudinal axis of the stuffing horn upon rotation or shifting of said bodies **(2, 3)** relative to one another results in a total surface having a greater circumference than the inner circumference of the unshirred tubular casing **(1)**.

4,505,004

PROCESS FOR SHUCKING AND EVISCERATING SCALLOPS

Jon O. Joensen, Holte, Denmark, assignor to Matcon Rädgivende Ingeni rfirma ApS., Herlev, Denmark

PCT No. PCT/DK82/00101, § 371 Date Jul. 15, 1983, § 102(e) Date Jul. 15, 1983, PCT Pub. No. WO83/01727, PCT Pub. Date May 26, 1983

PCT Filed Nov. 12, 1982, Ser. No. 519,774

Claims priority, application Denmark, Nov. 17, 1981, 5096/81; Dec. 11, 1981, 5502/81

Int. Cl.³ A22C *29/04*

U.S. Cl. 17—48 **6 Claims**

1. A process for shucking and eviscerating scallops by which the shells are caused to open and the edible portion is removed together with the viscera from which it is separated by mechanical treatment, characterized by

(a) treating the fresh scallops with an aqueous solution of 0.5–20 w/v % sodium or potassium hydroxide during a period between 1 minute and 2 hours,

(b) then treating in a conventional manner the scallops with boiling water or steam for 1 second-5 minutes, preferably 10 seconds-1 minute,

(c) isolating the edible portion of the scallops with sour-rounding viscera from the shells which are separated after the treatment in step (b), and

(d) removing the viscera from the edible portion.

4,505,005

GRATING ARRANGEMENT FOR AN OPENING ROLLER FOR FIBERS

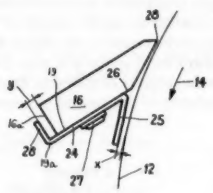
Urs Staehli, Turbenthal, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Oct. 11, 1983, Ser. No. 540,887

Claims priority, application Switzerland, Oct. 26, 1982, 6225/82

Int. Cl.³ D01B *3/00*

U.S. Cl. 19—200 **5 Claims**



1. A grating arrangement for a rotating opening roller provided with clothing, comprising:

a plurality of individual grating bars;

a respective guide element formed from sheet material and secured to each related grating bar;

each guide element extending over the length of the related grating bar;

each grating bar having a back portion;

each guide element comprising two band portions arranged adjacent to each other and extending in the longitudinal direction of the related grating bar;

said two band portions defining first and second band portions;

said first band portion forming a substantially flat surface which rests on a side surface of the related grating bar;

said second band portion forming a guide surface located adjacent the clothing of the opening roller and extending in approximately tangential direction thereto;

said guide element being shiftable substantially parallel to said side surface of said related grating bar in order to be able to adjust the spacing of the guide surface from the clothing of the opening roller;

said first band portion having a longitudinal side directed away from the second band portion;

each guide element being provided on said longitudinal side of the first band portion directed away from the second band portion with a third band portion; and

said third band portion being inclined with respect to the first band portion, extending in the longitudinal direction of its related grating bar and at least partially covering the back portion thereof.

4,505,006

CABLE CLAMP

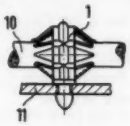
Guy Andre, Seyssinet-Pariset, France, assignor to A. Raymond, Lorrach, Fed. Rep. of Germany

Filed Jan. 10, 1984, Ser. No. 569,745

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 3300779

Int. Cl.³ F16L *3/08;* **F16B** *2/20*

U.S. Cl. 24—16 PB **4 Claims**



1. A clamp made of a resilient material for holding circular objects of different diameters to a fixed surface comprising a circular member that extends transversely around the object, the member having side rims, a central passageway, two ends that when spread apart provide access for the object to the passageway, and a leg at each end that cooperate with each other, when the ends of the member are compressed together, to hold the clamp to a fixed surface and a plurality of resilient holding fingers that extend outwardly from both side rims of the circular member along the length of the object and slant inwardly toward the center of the clamp so that they converge conically toward each other and grip the object being held whereby circular objects of different diameters up to near the full inside diameter of the central passageway can be held by the clamp.

4,505,007

MAGNET CLASP

Yoshihiro Aoki, 2-9-16, Hanahata, Adachi-ku, Tokyo, Japan (121)

Division of Ser. No. 442,046, Nov. 16, 1982, , which is a division of Ser. No. 264,769, May 18, 1981, abandoned. This application Jan. 26, 1984, Ser. No. 574,019

Claims priority, application Japan, Oct. 24, 1979, 54-147420; Apr. 8, 1980, 55-447791

Int. Cl.³ A44B *17/00;* **E05C** *17/56*

U.S. Cl. 24—303 **1 Claim**

1. A magnetic clasp, comprising:

a stationary part, said stationary part including:

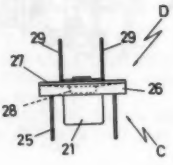
a permanent magnet having a first upper surface, a first lower surface beneath said first upper surface, and a first central hole extending through said permanent magnet and opening at opposite ends into said first upper surface and said first lower surface,

a first ferromagnetic plate secured to said first lower surface, and

a case and a cover, each composed of nonmagnetic material, covering substantially all of said permanent magnet and said first ferromagnetic plate, except said first central hole, said cover being located above said permanent magnet and having a second central hole aligned with said first central hole, said cover defining a magnetic gap between said cover and said permanent magnet;

a movable part, said movable part including a plug formed of ferromagnetic material, fittable into said second central hole;

means, formed of ferromagnetic material, for establishing a magnetic connection through said first and second central holes between said first ferromagnetic plate and said plug when said plug is fitted into said second central hole, such that said movable part is held firmly to said stationary part by a magnetic attracting force only when said plug is fitted into said second central hole said means formed of ferromagnetic material comprising a ferromagnetic pillar mounted to and projecting upward from said first ferromagnetic plate through said first central hole with a narrow annular gap between said pillar and the inner peripheral surface of said first central hole; and



a second ferromagnetic plate, having a second upper surface and a second lower surface below said second upper surface, secured to said first upper surface and having a third central hole aligned with said first and second central holes, said ferromagnetic pillar projecting through said third central hole and having an upper end surface flush with said second upper surface.

4,505,008

ADJUSTABLE FASTENER

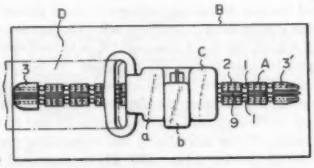
Kiichi Yoshikawa, Osaka, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 322,284, Nov. 17, 1981,. This application Apr. 23, 1984, Ser. No. 603,140

Claims priority, application Japan, Dec. 2, 1980, 55-172992; Dec. 2, 1980, 55-172993; Dec. 2, 1980, 55-172994; Dec. 2, 1980, 55-172995; Mar. 23, 1981, 56-40469

Int. Cl.³ A44B *19/40*

U.S. Cl. 24—401 **10 Claims**



1. An adjustable fastener comprising:

a rail for fitting on a garment so as to be overlying the surface of said garment, said rail having a plurality of individual spaced-apart stop elements and at least one elongate flexible connecting member extending along the length of

said rail so that said rail is flexible between said stop elements; and,

a slider fitting on said rail for adjustable sliding movement along the length thereof, said slider having a releasable locking member movable transversely of said rail;

said adjustable fastener being characterized in that said stop elements have respective base portions fixedly molded onto the connecting member and each of said stop elements being provided with, on the upper side of said respective base portion, two pairs of spaced-apart slider engaging projections protruding upwardly on opposed transverse sides of the base portion for selective engagement with said locking member of said slider therebetween, a central transverse channel formed between each said two pairs of projections for separately stitching each said base portion onto the surface of the garment, and one pair of slider guide means projecting downwardly on opposed transverse sides of each said respective base portion.

4,505,009

SLIDE FASTENER WITH A SEPARATOR ATTACHED THERETO

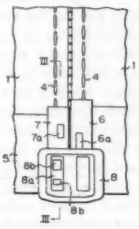
Hiroshi Yoshida, and Yoshiharu Yamaguchi, both of Toyama, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,790

Claims priority, application Japan, Sep. 27, 1982, 57/145926

Int. Cl.³ A44B *19/38*

U.S. Cl. 24—433 **5 Claims**



1. In a slide fastener with a separator attached thereto including:

(a) a pair of fastener stringers comprising a pair of fastener tapes and a pair of coupling elements in the form of a coil, each of said coupling elements being fixedly sewn to each of the side edges of the fastener tapes with a core cord threaded through the coil, a predetermined length of the coupling element being removed from fastener stringers at the lower part thereof so that the core cord remains as is;

(b) the separator comprising a male member and a female member fixedly secured to each of the lower end of the fastener stringers, and a box, the male member being secured to one of the fastener stringers and the female member and the box being secured to the other of the fastener stringers; the improvement consisting in that,

(c) the male member includes at least one first pawl which is bent inwardly of the rear surface of the male member, said first pawl piercing through the associated fastener tape until said first pawl reaches the core cord so that the male member is fixedly secured to one of the fastener stringers;

(d) the female member includes at least one second pawl which is bent inwardly of the rear surface of the female member, said second pawl piercing through the associated fastener tape until said second pawl reaches the core cord so that the female member is fixedly secured to the other of the fastener stringers; and

(e) the box includes at least one third pawl which is bent inwardly of the rear surface of the box, said third pawl piercing through the rear surface of the female member and the associated fastener tape so that the box is fixedly secured to the other of the fastener stringers while the third pawl extends in the superimposed state relative to said second pawl of the female member.

4,505,010

SPRING CLIP

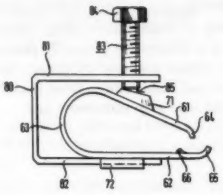
Knut Arenhold, Westend 7, 2000 Hamburg 52, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,314

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1981, 3138445

Int. Cl.³ B62D *25/16*

U.S. Cl. 24—456 **6 Claims**



1. A spring clip suitable for fastening a mud-flap to a motor vehicle, which clip comprises a first leg having a free end, a second leg having a free end, and a base conjoining said first and second legs at their ends remote from said free ends thereof, the clip being resilient and so-formed that in the relaxed state said legs converge towards one another at their said free ends, wherein an opening is provided in the first leg and said opening has externally accessible means for receiving and engaging one part of a two-part expanding tool, the second leg having an externally accessible contact region for the other part of the two-part expanding tool, said externally accessible contact region comprising a bar spaced outwardly of said second leg, between which bar and leg said other part of the expanding tool can be inserted and at least partially enclosed thereby, and the two parts of said tool being movable one relative to the other.

4,505,011

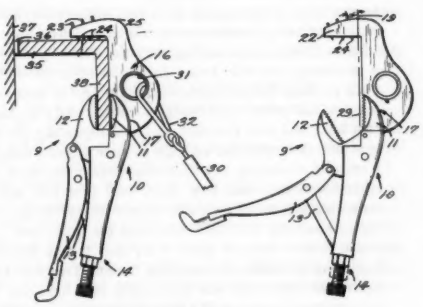
SAFETY BELT ANCHOR

James A. Dupuy, Vicksburg, Miss., assignor to Letourneau Company, Longview, Tex.

Filed Feb. 16, 1983, Ser. No. 467,163

Int. Cl.³ B25B *1/20*

U.S. Cl. 24—540 **20 Claims**



1. A structure for anchoring onto an angle iron or the like, comprising:

vise grips, including a stationary jaw, movable jaw, and jaw movement lever means;

an imaginary straight line extending between said stationary and movable jaws substantially parallel thereto when said jaws are in a clamping position;

a head fixed to said stationary jaw;

said head including a flange surface portion thereof extending in a dimension substantially perpendicular to, and intersecting, said imaginary line; and said surface portion being spaced from all portions of said stationary jaw a substantial distance along said imaginary line, so that when a first portion of an angle iron is received between said stationary and movable jaws, a second portion of angle iron, generally perpendicular to the first portion, is operatively engaged by said surface portion; and

means defining a through-extending opening in said head, extending in a dimension generally perpendicular to both said flange surface and said imaginary line, and formed in a portion of said head remote from said flange surface and adjacent said vise grip stationary jaw.

4,505,012

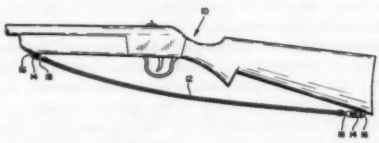
SLING SWIVEL

David A. Johnson, 3432 Tanglewood Way, Salem, Oreg. 97302

Filed Feb. 28, 1983, Ser. No. 470,712

Int. Cl.³ F41C *23/02*

U.S. Cl. 24—643 **23 Claims**



1. A detachable sling swivel comprising:

(a) loop means for receiving a sling therethrough, said loop means having a neck attached thereto, said neck having opposed first and second sides and defining at least a first bore extending therethrough;

(b) a first link disposed movably adjacent said first side of said neck;

(c) a pivot shaft fixedly connected to said first link, said pivot shaft extending into said first bore;

(d) biasing means associated with said pivot shaft for urging said first link toward said neck;

(e) a mounting pin having an inner end and an outer end, said inner end being fixedly connected to said first link;

(f) means defining a mounting pin hole, said means defining a mounting pin hole being fixedly connected with said neck portion, for receiving said outer end of said mounting pin, said pivot shaft being movable axially within said first bore and said first link and said mounting pin being movable therewith far enough to remove said outer end from said mounting pin hole, and said pivot shaft being rotatable within said first bore, said first link and said mounting pin being rotatable therewith, when said outer end is removed from said mounting pin hole; and

(g) stop means, spaced apart from said means defining a mounting pin hole and extending from said neck and away from said first bore, for protecting said first link from application of pressure in a direction tending to move said first link away from said neck, said first link being located alongside said stop means when said outer end is located in said mounting pin hole.

4,505,013

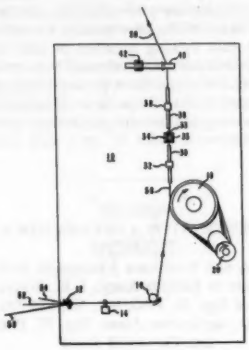
PROCESS AND APPARATUS FOR MAKING COHERENT YARN

Thomas L. Nelson, Georgetown, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 195,083, Oct. 30, 1980, abandoned. This application Nov. 1, 1982, Ser. No. 438,712

Int. Cl.³ D02J *1/08*

U.S. Cl. 28—274 **15 Claims**



1. A process for intermingling filaments of a least one continuous multifilament yarn by passing the yarn through a fluid-jet filament intermingling zone which includes an enclosed passageway with a yarn entrance and a yarn exit and a substantially cylindrical form in between them, and in said passageway impinging at least one high velocity jet of compressible fluid under high pressure, which intersects the longitudinal axis of the passageway, upon said yarn to vibrate and to intermingle filaments thereof while allowing the fluid to escape the passageway through said yarn entrance and yarn exit, wherein the process comprises forwarding said yarn under a controlled speed to and withdrawing it in more coherent form from said zone at a controlled withdrawal speed of 2–15% less than the forwarding speed, said forwarding and withdrawing being along a path which is substantially coaxial with said passageway, and peripherally constraining lateral filament vibrations in said yarn being forwarded upstream of said zone and substantially separating the fluid escaping through said yarn entrance from the forwarded yarn, both by tubular confinement which extends from the beginning of said zone at a point proximate to said yarn entrance and continues along said path coaxially for a distance of at least three inches upstream therefrom thereby reducing such pressure on the fluid in the passageway to increase turbulence and consequently the degree of intermingling of the filaments.

8. An apparatus for intermingling filaments of a least one continuous multifilament yarn which comprises a fluid-jet filament intermingling body member, a substantially cylindrical yarn passageway through said body member having a yarn entrance end and a yarn exit end, at least one fluid conduit leading into said passageway through said body member having an axis which intersects the longitudinal axis of said passageway, means for supplying compressible fluid under high pressure to said conduit, means for forwarding at least one yarn at a controlled speed to the entrance of said passageway, means for withdrawing intermingled yarn from said yarn exit end at a controlled speed from 2 to 15% less than the forwarding speed, a yarn guide positioned between said means for forwarding yarn and said yarn entrance end which guide defines a straight yarn path between said guide and said yarn entrance end which path is coaxial with said passageway, said guide consisting essentially of a tube having a longitudinal bore substantially coaxially aligned with said passageway and positioned along a straight line path between said mean for for-

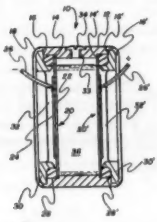
warding yarn and said yarn entrance end, said bore having a diameter substantially less than the diameter of said passageway but large enough to allow free passage of said yarn through said bore while peripherally constraining lateral filament vibrations and lateral yarn movement in said bore, said bore having an exit end located proximate to but separated from said passageway entrance end and a length of at least 3 inches whereby fluid escaping form the yarn entrance is separated from the forwarded yarn thereby reducing such pressure in the passageway to increase turbulence and consequently the degree of intermingling of the filaments.

4,505,014

ACCELEROMETER MANUFACTURING METHOD

William O. McNeel, and James A. Sackett, both of Houston, Tex., assignors to Litton Resources Systems, Inc., Alvin, Tex.

Filed Dec. 19, 1983, Ser. No. 562,920
Int. Cl.³ H01L *41/22*
U.S. Cl. 29—25.35 **5 Claims**



1. A method for manufacturing a compound accelerometer that is maximally sensitive to a desired acceleration vector to the substantially complete exclusion of unwanted acceleration vectors, comprising the steps of:

selecting several sets of two, oppositely-polarized piezoelectric transducers, from among a plurality of transducers, each said set being characterized by a predefined combined series capacitance value and an output voltage sensitivity at least equal to a desired threshold value;

mounting, in spaced-apart relationships, each said set of two transducers in individual containers thereby to provide several simple accelerometer units;

inserting a predetermined volume of a liquid inertia mass into each said container;

exciting said simple accelerometer units at a prescribed acceleration level and a prescribed frequency;

continuously measuring the total output voltages of each of the several simple accelerometer units and micro-adjusting the volumes of the liquid masses during excitation until the total output voltage of each unit equals a predetermined value;

measuring and tabulating the residual output voltage differences between the individual transducers of each said simple accelerometer unit and identifying the electrically dominant transducer of each unit;

sorting the simple accelerometer units by pairs such that the two simple accelerometer units of each pair are substantially exactly matched as to residual output voltages; and

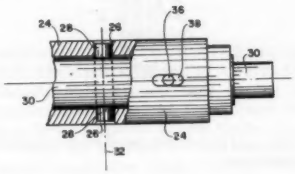
securing together the two matched units of each pair with the electrically dominant transducers facing in opposite directions with respect to one another.

4,505,015

BALANCED FORCE ROLLER

John P. Ross, Cupertino, and Carl E. Bernardi, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 19, 1982, Ser. No. 399,616
Int. Cl.³ B21B *13/02*
U.S. Cl. 29—116 R **2 Claims**



1. A roller for providing balanced forces along the surface of the roller which surface is parallel to the axis of rotation of the roller comprising:

a generally cylindrical roller surface member having an axis of rotation and adapted to provide a balanced force rolling surface on the outside;

bearing support means disposed within said surface member at least to the extent of being located centrally with respect to the length along said axis of said balanced force rolling surface;

bearing means on said bearing support means adapted to carry said rolling surface in rotational movement about said axis of rotation;

a support member disposed along said axis of rotation;

a pivot bearing means extending from said support member to said bearing support means, said pivot bearing means located centrally with respect to the length of said balanced force rolling surface along said axis, said pivot bearing means having a pivot axis that extends orthogonally relative to said axis of rotation of said roller, and said bearing support means being rotatable about said pivot axis on said pivot bearing means; and

alignment projection means extending from said support member, in a direction substantially orthongonal to both the axis of rotation and said pivot axis, into engagement with said bearing support means so as to maintain alignment of said surface member with said axis of rotation during rotation of said bearing support means about said pivot axis.

4,505,016

METHOD OF MANUFACTURING A DIE-CAST WOBBLE PLATE ASSEMBLY

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 30, 1983, Ser. No. 509,638
Int. Cl.³ B23P *15/10*; B22D *17/00, 19/12*
U.S. Cl. 29—156.5 R **3 Claims**

1. A method of manufacturing a piston and swash plate assembly, comprising the steps of:

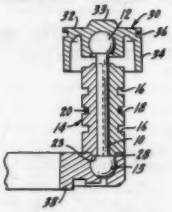
(1) fabricating a plurality of dumbelllike connecting rods, each having a rod, a first ball end and a second ball end;

(2) positioning a split insert on each of said rods, in a position abutting said first end of each of said the connecting rods;

(3) casting a plurality of pistons, with each piston encircling one of said first ends of the connecting rods to allow relative movement therebetween;

(4) providing a swash plate die defining complementary sockets, positioning said second ends of the connecting rods in said sockets, and moving said insert to abut said second end of each connecting rod;

(5) casting a swash plate about said second ends to allow relative movement therebetween; and



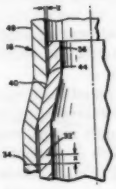
(6) machining said piston and swash plate assembly to predefined dimensions.

4,505,017

METHOD OF INSTALLING A TUBE SLEEVE

Glen E. Schukei, South Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 15, 1982, Ser. No. 449,917
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.3 R **12 Claims**



1. A method for installing a close-fitting cylindrical metal sleeve within a tube secured to a tube sheet of a steam generator, comprising the sequential steps of:

inserting the sleeve into the tube until an upper portion of the sleeve is above the tube sheet while a lower portion of the sleeve is within the tube sheet;

outwardly radially deforming said upper portion of the sleeve and the adjacent tube wall to form substantially coextensive permanent bulges around the circumferences of the sleeve and tube;

further inserting the sleeve to axially displace the sleeve bulge relative to the tube bulge, whereby a tight mechanical interference seal is formed between the sleeve bulge and the tube wall;

permanently joining and sealing said lower portion of the sleeve to the adjacent tube wall while the sleeve bulge is displaced relative to the tube bulge.

4,505,018

UNDERWATER STUD GUN SYSTEM AND METHOD FOR ATTACHING AN ARTICLE TO AN UNDERWATER STRUCTURE

John A. Regalbuto; Glenn B. Christopher, both of Fort Worth, and Jerry D. Motley, Arlington, all of Tex., assignors to Jet Research Center, Inc., Arlington, Tex.

Filed Sep. 8, 1982, Ser. No. 415,780
Int. Cl.³ B23P *11/00*; B25C *1/08*
U.S. Cl. 29—432 **32 Claims**

1. A system for attaching an article to an underwater structure, comprising:

an article attachment fitting having a fastener receiving passage disposed therein, said passage including an inlet, an outlet, and being at least partially defined by a tapered annular inner shoulder of said fitting facing away from said outlet;

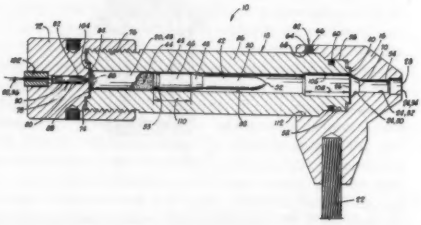
a stud gun having a barrel with a cylindrical barrel bore disposed therein, said barrel being connected to said attachment fitting so that an outlet of said barrel bore is aligned with and adjacent said inlet of said fastener receiving passage; and

a cartridge disposed in said barrel bore of said stud gun, said cartridge having a fastener disposed therein to be ejected from said barrel bore of said stud gun into said fastener receiving passage upon the firing of a propellant charge contained in said cartridge, said fastener including a tapered outer surface means adapted to engage said tapered annular inner shoulder of said attachment fitting as said fastener moves through said fastener receiving passage and to thereby limit the movement of said fastener through said fastener receiving passage, said tapered outer surface means further providing a means for tightly engaging said fastener with said attachment fitting.

28. A method of attaching an article to an underwater structure, said method comprising the steps of:

assembling together:

an article attachment fitting having a fastener receiving passage disposed therein, said passage including an inlet, an outlet, and being at least partially defined by a tapered annular inner shoulder of said fitting facing away from said outlet;



a stud gun having a barrel with a cylindrical barrel bore disposed therein, said barrel being connected to said attachment fitting so that an outlet of said barrel bore is aligned with and adjacent said inlet of said fastener receiving passage; and

a cartridge disposed in said barrel bore of said stud gun, said cartridge having a fastener disposed therein to be ejected from said barrel bore of said stud gun upon the firing of a propellant charge contained in said cartridge, said fastener including a tapered outer surface;

engaging said attachment fitting with a wall of said underwater structure so that said outlet of said fastener receiving passage is adjacent said wall;

measuring relative perpendicularity of said barrel relative to said wall of said subsea structure;

orienting said barrel substantially perpendicular to said subsea structure;

firing said propellant charge of said cartridge;

thus propelling said fastener forward through said barrel bore into said fastener receiving passageway with a forward end of said fastener extending out said outlet of said fastener receiving passage and piercing said wall of said underwater structure;

stopping forward motion of said fastener upon engagement of said tapered outer surface of said fastener with said tapered annular inner shoulder of said fitting; and

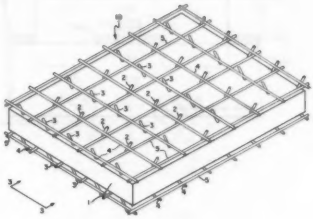
dissipating a kinetic energy of said fastener by tightly wedging said tapered outer surface of said fastener into said tapered annular inner shoulder of said fitting.

4,505,019

METHOD OF FORMING CONSTRUCTION PANEL

Dietrich F. Deinzer, Caixa Postal 55, 09900 Diadema-S.P., Brazil

Filed Mar. 2, 1983, Ser. No. 471,494
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—432 8 Claims



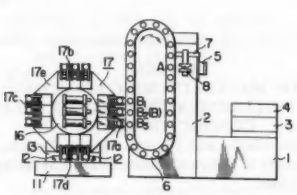
1. A method for forming reinforced panels comprising the steps of:
providing first a panel of insulation having two major surfaces,
piercing the insulation panel with rod like members so that portions of the rod like members extend out from both major surfaces.
superimposing on each major surface a grid formed from a plurality of longitudinally and latitudinally extending bar like members which are formed by attaching the bar like members at intersections thereof,
orienting the grids and initially the rod like members so that some of the rod like members contact different bar like members,
welding the bar like members to the rod like members at the point of tangency.

4,505,020

TOOL REPLACING DEVICE

Mikio Kinoshita, Komaki, Japan, assignor to Okuma Machinery Works Ltd., Nagoya, Japan

Filed Jul. 27, 1983, Ser. No. 517,571
Claims priority, application Japan, Jul. 31, 1982, 57-135020
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 5 Claims



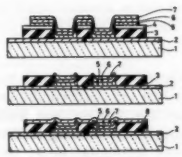
1. In a machining center equipped with a tool storage magazine having a linear portion in which a plurality of tools are arrayed in a row at a predetermined pitch, and a tool exchanging arm by which the tool exchange is made between a machine tool and said magazine,
a tool replacing device comprising:
a turret having a plurality of tool holding sections and adapted to make an indexing rotation to bring any one of said tool holding sections to an index position adjacent to said linear portion;
a plurality of tool grippers attached to each of said tool holding sections of said turret and adapted to grip tools in such a manner that the axes of the gripped tools extend in the same direction as the axes of the tools stored in said linear portion of said tool storage magazine and that the axes of the gripped tools are spaced from adjacent ones by the same distance as that between adjacent tools stored in said linear portion of said tool storage magazine; and
a driving means adapted to cause a selective movement of said tool grippers in the tool holding section in said indexed position, in the direction of the axes of said gripped tools and in the direction perpendicular to the axes of said gripped tool towards and away from said linear portion of said tool storage magazine, thereby to effect a tool exchange between said tool grippers and said magazine.

4,505,021

METHOD FOR MANUFACTURING AN ELECTROCHROMIC DISPLAY DEVICE

Hiroshi Hamada, Nara; Hiroshi Take, Ikoma; Kozo Yano, Yamatokoriyama, and Yasuhiko Inami, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1982, Ser. No. 434,502
Claims priority, application Japan, Oct. 22, 1981, 56-169614; Dec. 29, 1981, 56-210291
Int. Cl.³ G02F *1/17*
U.S. Cl. 29—570 12 Claims



1. A method for preparing an electrochromic display device comprising first and second electrochromic layers, and a solid electrolyte interposed therebetween, comprising the steps of:
forming a conductive film at desired areas on a substrate;
forming an insulating film over substantially the entire surface of said substrate;
forming a resist layer over substantially the entirety of the insulating film other than the desired locations of a display pattern and at least one lead-in electrode;
removing the insulating film at said desired locations;
forming the first and the second electrochromic layers and the solid electrolyte interposed therebetween over portions of said substrate other than said at least one lead-in electrode;
removing the resist layer and the entirety of the first and the second electrochromic layers and the solid electrolyte layer formed thereon; and
forming at least one electrode on the second electrochromic layer.

4,505,022

JUNCTION VERTICAL FIELD EFFECT TRANSISTOR AND PROCESS FOR THE PRODUCTION THEREOF

Pierre Briere, Paris, France, assignor to Thomson-CSF, Paris, France

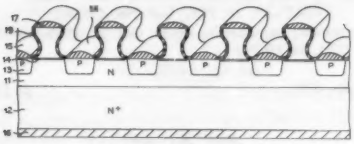
Filed Jun. 10, 1982, Ser. No. 387,237
Claims priority, application France, Jun. 16, 1981, 81 11838
Int. Cl.³ H01L *29/06*
U.S. Cl. 29—571 3 Claims

1. A process for manufacturing on a silicon wafer a junction vertical field effect transistor having a source electrode and a gate electrode, said electrodes being shaped as parallel interdigitated fingers of very small width, said process comprising the following steps:
forming on a major surface of a monocrystalline substrate of a first type of conductivity a doped polycrystalline silicon layer of the same first type, said layer having a lower slightly doped portion, a median highly doped portion, and an upper slightly doped portion,

forming on the polycrystalline layer a masking layer having a pattern of parallel fingers of very small width and spacing,

etching the polycrystalline silicon where it is not masked until exposing the monocrystalline silicon substrate, using an etching agent which more rapidly etches highly doped silicon than slightly doped silicon, thus leaving on the substrate parallel fingers of polycrystalline silicon separated by exposed portions of monocrystalline silicon, said fingers having a rail-shaped cross-section with enlarged width in an upper and lower portions of their height, corresponding respectively to the said upper and lower portions of said polycrystalline layer,

forming an insulating layer comprising silicon oxide and entirely covering the exposed monocrystalline silicon and the polycrystalline fingers,



implanting an impurity of a second type of conductivity opposite to the first type perpendicularly to the said major surface of the substrate, on the whole of this surface, therefore doping the insulating layer except where it is protected against implantation by the upper portion of said fingers,

removing the insulating layer where it has been implanted and removing the masking layer on the polycrystalline silicon fingers,

performing an annealing treatment,

sputtering a conductive substance perpendicularly to said major surface of the substrate so that this conductive substance is deposited only on said polycrystalline fingers and on said monocrystalline substrate between the fingers.

4,505,023

METHOD OF MAKING A PLANAR INP INSULATED GATE FIELD TRANSISTOR BY A VIRTUAL SELF-ALIGNED PROCESS

Wen F. Tseng, Silver Spring, and Marvin L. Bark, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 427,027
Int. Cl.³ H01L *21/20, 21/302*
U.S. Cl. 29—571 **7 Claims**

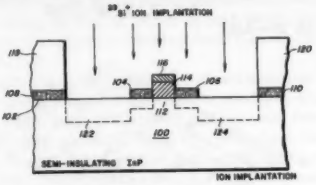
1. A method of forming a planar InP semiconductor insulated gate field effect transistor comprising the steps of:

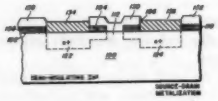
forming an InP semiconductor substrate including a principal planar surface;

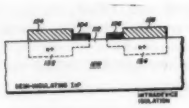
forming first and second channel alignment insulating layers on said principal surface, said first and second alignment layers having opposing edges which define the intersection of a channel region in said substrate with said principal surface, said opposing edges being separated by a distance equal to the length of said channel region;

forming a masking layer on said principal surface between said first and second alignment layers;

implanting ions of an N conductivity type dopant into said substrate through said principal surface to form source and drain beds of an N type conductivity in said substrate, said source and drain beds extending to said principal surface, said source and drain beds including opposing edges which are aligned with said opposing edges of said first and second alignment layers, said source and said drain beds being separated by said channel region, said masking layer preventing said ions from being implanted in said channel region; removing said masking layer; annealing said source and drain beds; forming a gate insulation layer on said principal surface over at least a contiguous active portion of said channel region extending between said source bed and said drain bed; and forming a gate electrode layer on said gate insulation layer over the entirety of said contiguous active portion of said channel region.







4,505,024

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE, INCLUDING A STEP OF PATTERNING A CONDUCTOR LAYER

Keiichi Kawate, Ooita, and Hiroshi Sekiya, Oonojo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

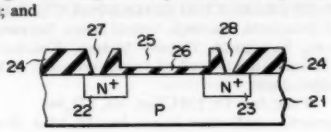
Filed May 17, 1983, Ser. No. 495,409
Claims priority, application Japan, May 20, 1982, 57-85215
Int. Cl.³ H01L *21/22, 21/31, 21/28*
U.S. Cl. 29—571 **14 Claims**

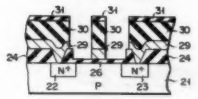
1. A method of manufacturing a semiconductor device, including a step of forming a patterned conductor layer, comprising steps of:

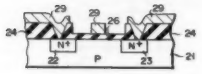
forming a conductor layer on an insulating layer which is formed on a semiconductor substrate and which has thick and thin portions with a step therebetween;

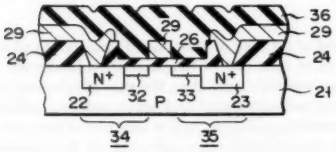
coating a material having an etching rate substantially equal to that of the material of said conductor layer, thereby forming a film so that those portions of a laminated structure consisting of said conductor layer and said film which are on the thin portion of said insulating layer and said step have the same thickness;

forming a mask layer of a predetermined pattern on said film; and









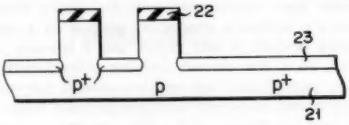
selectively etching said laminated structure by using said mask layer to cause the surface of the thin portion of said insulating layer to be partially exposed.

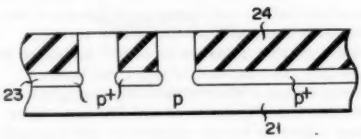
4,505,025

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE

Kei Kurosawa, and Fumio Horiguchi, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 23, 1983, Ser. No. 497,407
Claims priority, application Japan, May 31, 1982, 57-92917
Int. Cl.³ H01L *21/95, 21/76*
U.S. Cl. 29—576 W **21 Claims**





1. A method for manufacturing a semiconductor device comprising the following steps:

A. forming at least one first groove by selectively etching a field region of a substrate; then

B. forming on the entire surface of said substrate, including said first groove, a first insulating film having a thickness substantially equal to or greater than the depth of said first groove; wherein said insulating film is formed on said substrate with at least one second groove corresponding to said first groove and wherein at least one of said second grooves has a width greater than the depth of said second groove; followed by

C. selectively forming in at least one of said second grooves a second insulating film having a thickness substantially equal to the depth of said second groove; and then

D. forming a third insulating film having a flat surface over the entire surface of the resulting structure; followed by

E. anisotropically dry etching the resulting structure to expose the surface of said substrate such that said first insulating material is buried in said field region; wherein the etching rate for said first, second and third insulating materials are substantially equal to each other or the etching rate for said first insulating material is higher than those for said second and third insulating materials; and then

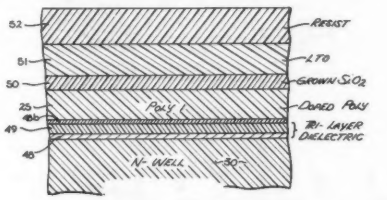
F. forming semiconductor elements in the surface region of said substrate which are isolated from said first insulating material.

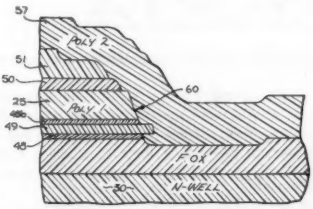
4,505,026

CMOS PROCESS FOR FABRICATING INTEGRATED CIRCUITS, PARTICULARLY DYNAMIC MEMORY CELLS

Mark T. Bohr, Beaverton; Ken K. Yu, Portland; Leo D. Yau, Durham, and Shyam G. Garg, Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jul. 14, 1983, Ser. No. 513,658
Int. Cl.³ H01L *21/306, 21/31*
U.S. Cl. 29—577 C **5 Claims**





1. In the fabrication of metal-oxide-semiconductor integrated circuits, a process for defining patterns in a polysilicon layer comprising the steps of:

growing a silicon dioxide layer on the upper surface of said polysilicon layer;

forming a second silicon dioxide layer over said grown silicon dioxide layer by using a chemical vapor deposition step;

forming a photoresist layer over said second silicon dioxide layer;

defining patterns in said photoresist layer;
etching said second silicon dioxide layer employing a wet etchant such that said second silicon dioxide layer is undercut under said photoresist layer;
etching said grown silicon dioxide layer in alignment with said photoresist layer employing an anisotropic etching step;
etching said polysilicon layer employing a wet etch such that undercutting of said polysilicon layer occurs beneath said grown silicon dioxide layer;
removing portions of said grown silicon dioxide layer which extended from between said polysilicon layer and said second silicon dioxide layer;
whereby a well-sloped surface is defined along the etched edges of said grown and second silicon dioxide layers and polysilicon layer, allowing better formation of subsequent layers on said etched surfaces.

4,505,027

METHOD OF MAKING MOS DEVICE USING METAL SILICIDES OR POLYSILICON FOR GATES AND IMPURITY SOURCE FOR ACTIVE REGIONS

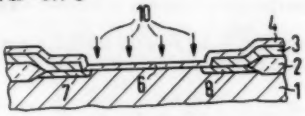
Ulrich Schwabe; Franz Neppl; Ulf Bürker, all of Munich, and Werner Christoph, Krailling, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

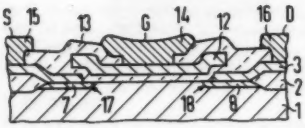
Filed Jan. 30, 1984, Ser. No. 575,138

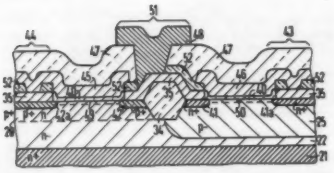
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304588

Int. Cl.³ H01L *21/74, 21/265*

U.S. Cl. 29—577 C **21 Claims**







1. Method of producing MOS transistor with flat source/-drain zones, short channel lengths, and a self-aligned contacting plane comprised of a metal silicide, wherein said method comprises the step of: producing said source/drain zones in a silicon semiconductor substrate by out-diffusion of said contacting plane, said contacting plane comprising a doped metal silicide and being deposited directly on said substrate..

4,505,028

METHOD OF PRODUCING SEMICONDUCTOR DEVICE

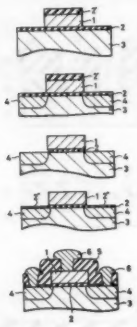
Nobuyoshi Kobayashi, Hachioji; Seiichi Iwata, Sayama; Naoki Yamamoto, Kawaguchi; Hitoshi Matsuo, Kokubunji, and Teiichi Homma, Koutou, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 19, 1984, Ser. No. 571,946

Claims priority, application Japan, Jan. 19, 1983, 58-6868

Int. Cl.³ H01L *21/44, 29/40*

U.S. Cl. 29—578 **33 Claims**



1. A method of forming at least one of electrodes and interconnections of at least one of tungsten or molybdenum on a semiconductor substrate, including the step of selectively oxidizing the exposed surface of said semiconductor substrate, without substantially oxidizing said at least one of tungsten and molybdenum on the substrate, by carrying out heat-treatment in a hydrogen atmosphere containing water vapor.

4,505,029

SEMICONDUCTOR DEVICE WITH BUILT-UP LOW RESISTANCE CONTACT

King Owyang, Baldwinsville, N.Y., and Leonard Stein, deceased, late of Dewitt, N.Y. (by Vera Stein, executrix), assignors to General Electric Company, Syracuse, N.Y.

Continuation of Ser. No. 246,231, Mar. 23, 1981,. This application Jul. 8, 1983, Ser. No. 501,745

Int. Cl.³ H01L *23/48, 29/44*

U.S. Cl. 29—589 **8 Claims**

1. A method for making a built-up metal contact for a controllable high current semiconductor device which contact includes a vertically conducting portion on a high current carrying portion of said device and a laterally conducting portion on a low current carrying control portion of said device, each of said high and low current carrying portions having lateral configuration which includes fingers interdigitated with the fingers of the other current carrying portion; said method comprising the steps of:

simultaneously forming first and second laterally spaced apart metal layers on said high and low current carrying portions respectively, each of said metal layers conforming substantially to said lateral configuration of the underlying current carrying portion of said device;

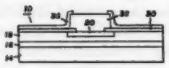
forming a curable insulative dielectric dual-layer substantially fully covering both of said metal layers;

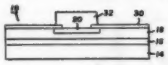
exposing an upper surface substantially throughout the complete lateral configuration of said first metal layer;

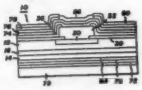
forming a layer of barrier material on said exposed upper surface which fully covers said surface;

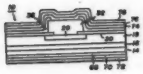
forming a layer of solderable material on said layer of barrier material substantially fully covering said barrier material;

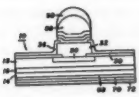
forming a layer of solder on said layer of solderable material substantially fully covering said solderable material; and











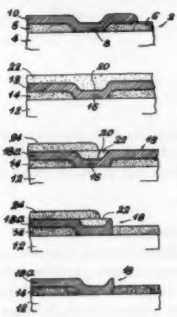
attaching a metal plate to said layer of solder throughout the full lateral configuration of said solder layer.

4,505,030

PROCESS FOR POSITIONING AN INTERCONNECTION LINE ON AN ELECTRICAL CONTACT HOLE OF AN INTEGRATED CIRCUIT

Pierre Jeuch, Seyssins, France, assignor to Commissariat a l'Energie Atomique, Seyssins, France

Filed Apr. 12, 1983, Ser. No. 483,959
Claims priority, application France, Apr. 14, 1982, 82 06409
Int. Cl.³ H01L *21/283*
U.S. Cl. 29—591 **6 Claims**



1. A process for making a self-positioning electrical connection to the active zone of an integrated circuit comprising the steps of

A. depositing a circuit-insulating layer on the active zone of the integrated circuit;

B. locally etching the circuit-insulating layer to form an electrical contact hole which exposes said zone;

C. depositing a conductive layer from which the connection is to be formed on the integrated circuit which covers the circuit-insulating layer and the portion of the zone exposed in said hole;

D. depositing an insulating layer on the conductive layer which blanks the relief thereof and has a planar surface;

E. etching the insulating layer so that insulating material is left only at the location of the electrical contact hole;

F. depositing a resin layer on the integrated circuit so as to mask the electrical connection to be produced;

G. etching the part of the conductive layer which is free from resin and the residual insulating layer; and

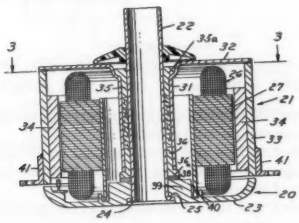
H. removing the remaining insulating layer and the resin layer to form an interconnection line on the electrical contact hole.

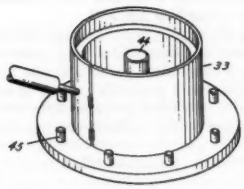
4,505,031

METHOD OF ASSEMBLING AN ELECTRIC MOTOR

Robert Colwell, and Robert J. Bartell, both of Owosso, Mich., assignors to Universal Electric Company, Owosso, Mich.

Filed Sep. 28, 1982, Ser. No. 425,410
Int. Cl.³ H02K *15/16*
U.S. Cl. 29—596 **5 Claims**





1. The method of assembling an electric motor which comprises

forming a rectangular blank into a cylinder,

placing the blank on a cylindrical fixture,

fastening the adjacent ends of the blank to one another to provide a cylindrical shell having an internal diameter conforming to the external diameter of the cylindrical fixture,

providing a top plate with a first cylindrical axial tube,

providing bearings in the tube,

placing the top plate with the first axial tube on the open end of the shell on the fixture with the bearing members engaging a guide member on the fixture which is concentric with the cylinder of the fixture,

fastening the top plate to the top of the shell to provide an upper housing assembly,

securing a second cylindrical axial tube on a radial wall,

supporting a stator with an annular wall on the internal surface of said stator within a second fixture having an opening for receiving the second tube,

moving the stator and annular wall toward the radial wall,
guiding the stator by interengagement of the second tube with the guide opening in the second fixture to maintain the second tube in concentric relationship and bring the annular wall into a groove in the radial wall,
securing the annular wall to said radial wall to provide a lower housing assembly,
thereafter placing a thrust washer in position on the second tube in engagement with the radial wall of the lower housing assembly and telescoping the upper and lower housing ssemblies bringing the second axial tube axially through the bearings in the first tube.

4,505,032

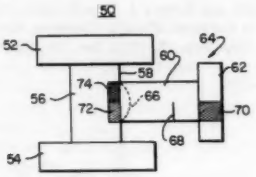
METHOD OF MAKING A VOLTAGE DIVIDER

Guy B. Praria, Wayland, Mass., assignor to Analogic Corporation, Wakefield, Mass.

Division of Ser. No. 507,744, Jun. 27, 1983, Pat. No. 4,475,099. This application Jun. 29, 1984, Ser. No. 626,531

Int. Cl.³ H01C *17/28*

U.S. Cl. 29—621 **1 Claim**



1. A method of making a voltage divider having at least one Kelvin connection tap comprising:
constructing first and second spaced terminals;
forming current-carrying resistor between said first and second terminals;
constructing a third terminal spaced from said resistor;
forming at least one conductive non-current-carrying peninsula of said resistor extending from a side of said resistor and connecting with said third terminal to produce a Kelvin connection tap; and
trimming the setting of the voltage divider by cutting into only said non-current-carrying peninsula along a path having a component parallel to said side of said resistor from which said peninsula extends to adjust the interconnection of said third terminal with said resistor and vary the voltage output without varying the resistance of the resistor.

4,505,033

METHODS OF MAKING HIGH VOLTAGE RESISTANT MEMBERS

Edward S. Wheeler, Batavia, N.Y., assignor to Interpace Corporation, Purchase, N.Y.

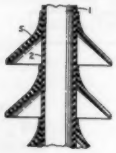
Continuation-in-part of Ser. No. 19,849, Mar. 12, 1979, Pat. No. 4,312,123. This application Nov. 5, 1981, Ser. No. 318,619

The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.

Int. Cl.³ H01B *19/00, 17/02, 17/28*

U.S. Cl. 29—631 **4 Claims**

1. In a method of making a high voltage resistant integrated member characterized by:
extruding a sheath of essentially unvulcanized elastomer on a core, said extrusion being performed at a temperature below the vulcanizing temperature of the elastomer, the elastomer being selected from the group consisting of ethylene-propylene-diene copolymers, ethylene-propylene copolymers, and butyl rubber;
mounting at least one fully vulcanized elastomeric shed on the sheath, the shed being fabricated from a material of the same or similar elastomer formulation as used for the sheath, and
then heating the core-shed-sheath assemblage to vulcanize the sheath and bond same to the core and to the shed;
an improvement in the step of mounting before the step of heating to vulcanize comprising:



expanding the sheds at room temperature to allow fitting them onto the sheath,
cooling the sheds while maintaining them expanded,
placing the cooled expanded sheds on the sheath covered core, and
then allowing the sheds to shrink tightly onto the sheath by warming them to room temperature.

4,505,034

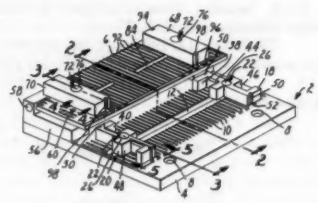
LOCATING FIXTURE ASSEMBLY

Dean K. Reidt, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 21, 1982, Ser. No. 400,342

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—749 **18 Claims**

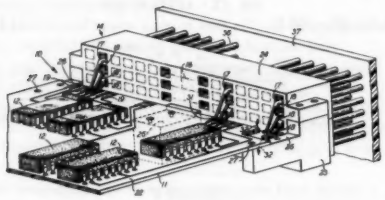


1. A fixture for aligning flat electrical cable having a plurality of conductors and an electrical connector having a plurality of contacts corresponding to the number of conductors, comprising:
a flat base;
raised ridges on said base;
two locating guides including opposed connector-accepting notches and longitudinal grooves corresponding to and engaging said ridges to afford adjustable positioning of said guides with respect to each other on said base;
cable platform means for supporting said cable; and
means for mounting said cable platform means in spaced relationship to said base and for permitting movement of said cable toward said base and into said connector.

4,505,035
METHODS OF ALIGNING AND MOUNTING A PLURALITY OF ELECTRICAL LEADS TO A PLURALITY OF TERMINALS

William H. Burton, Lee's Summit, and William E. Snow, Grandview, both of Mo., assignors to AT&T Technologies, Inc. and Bell Telephone Laboratories, Inc., both of New York, N.Y.

Filed Apr. 11, 1983, Ser. No. 483,991
Int. Cl.³ H05K *3/00*
U.S. Cl. 29—843 **7 Claims**



1. A method of aligning and assembling a plurality of electrical leads to a plurality of terminals spaced at predetermined intervals on a circuit substrate, which comprises:

moving the leads into parallel guide grooves spaced in positions corresponding to such predetermined intervals;

holding the leads in such spaced positions in said guide grooves while forming a spacing material over each of the leads and into spaces between adjacent ones of the leads, such that the spacing material in the spaces between the leads is formed to a level below the leads;

assembling the spaced leads to said correspondingly spaced terminals by urging the leads into contact with the terminals to cause the leads to resiliently bear against the corresponding terminals, whereby the spacing material laterally guides each of the leads into positions in alignment with the terminals;

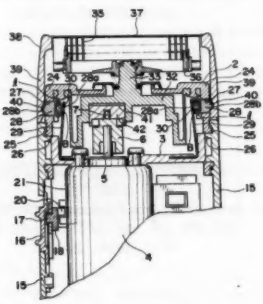
removing the spacing material from the spaces between the leads after assembling the spaced leads to the correspondingly spaced terminals, whereby friction between the leads and the terminals retains the spacing of the leads; and

bonding the leads to the respective terminals.

4,505,036
ELECTRIC SHAVER ARRANGED TO BE TILTED

Masahiko Ochiai, and Yoshinori Taito, both of Nogata, Japan, assignors to Kyushu Hitachi Maxell, Ltd., Fukuoka, Japan

Filed Mar. 10, 1983, Ser. No. 474,039
Claims priority, application Japan, Mar. 15, 1982, 57-36697[U]; Mar. 16, 1982, 57-37753[U]
Int. Cl.³ B26B *19/10*
U.S. Cl. 30—34.1 **3 Claims**

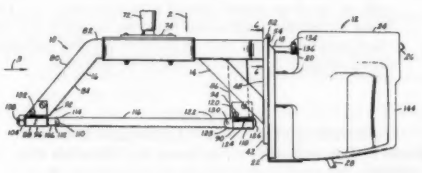


1. An electric shaver which comprises a main casing (1), an upper casing (2) including a shaving movable blade (35) and a screen blade holder (38) detachably attached onto said upper casing (2), said upper casing (2) being coupled to said main casing (1) for pivotal movement between a first position (P1) directed in parallel to an axis of the main casing (1) and a second position (P2) inclined at a predetermined angle with respect to the axis of the main casing (1), a vibrating member (32) arranged to be vibrated in one unit with the shaving movable blade (35) and provided in said upper casing (2), a vibration driving means (42) and a driving means for the vibration driving means (42) which are provided in said main casing (1), means for positioning the upper casing (2) at said first and second positions (P1) (P2) and means for locking said screen blade holder (38) on said upper casing (2), and a trimmer unit (10) arranged to be projectable from or retractable into the main casing (1) through pivotal movement of said trimmer unit (10) so as to be projected in a direction opposite to the direction of the pivotal movement of said upper casing (2) towards said second position (P2) intersecting at right angles with vibrating direction of said shaving movable blade (35), said vibrating member (32) being engaged with said vibrating driving member (42) so as to be slidable in the direction of the pivotal movement of said upper casing (2) for tilting towards said second position (P2), said vibration driving member (42) being provided with an engaging portion (45) which is engageable with or disengageable from an engageable portion (46) provided on a movable blade (13) of the trimmer unit (10) following the pivotal movement of said trimmer unit (10) for the projection and retraction.

4,505,037
HACK SAW ATTACHMENT FOR SABRE SAW

Eugene L. Farkas, 8092 Jewett, Warren, Mich. 48089

Filed Sep. 24, 1982, Ser. No. 422,683
Int. Cl.³ B27B *11/02*
U.S. Cl. 30—122 **12 Claims**



1. A hack saw attachment for a sabre saw whereby a motor driven hack saw is provided, said hack saw attachment comprising attachment guide means including an attaching plate adapted to be secured to the sabre saw, parallel spaced apart hack saw guide members extending substantially perpendicularly to the attaching plate for guiding hack saw means in reciprocating movement with respect to the attachment guide means and diagonal bracing members located between the attaching plate and the hack saw guide members, said sabre saw having a reciprocal member adapted to reciprocate on energizing of the sabre saw, hack saw means positioned in the attachment guide means for reciprocating movement with respect thereto and coupling means for securing the hack saw means to the reciprocal member of the sabre saw for producing reciprocation of the hack saw means in the attachment guide means on energizing of the sabre saw.

4,505,038
COMPOUND LEVER TOOLS FROM SHEET METAL

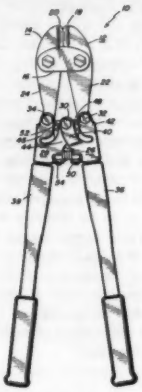
Thomas M. Porter, Concord, Mass., assignor to H.K. Porter, Inc., Somerville, Mass.

Filed Nov. 21, 1983, Ser. No. 554,087
Int. Cl.³ B26B *17/02*
U.S. Cl. 30—193 **7 Claims**

1. An improved, compound lever tool, having a pair of

interpivoted head levers with jaws at their forward ends and tails at their rearward ends; and a toggle mechanism comprising two actuating levers pivoted together, the actuating levers having forward ends connected to the tails of the head levers and rearward ends adapted to receive handle arms to which force may be applied, the improvement wherein:

the toggle mechanism further comprises at least one actuating lever formed from a metal sheet, each sheet being bent to provide an upper and a lower surface; and each surface carrying holes which are aligned to receive a toggle pivot



rod to connect the actuating levers together and to receive a head pivot rod to connect the actuating lever to the tail of its respective head lever; and

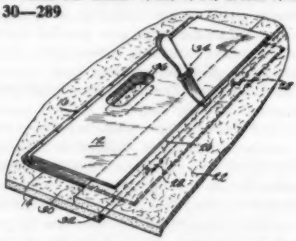
at least one sheet metal-formed actuating lever is cloven inwardly to separate a toggle pivot-supporting part from a head pivot-supporting part, and the toggle mechanism further comprises at least one block received within the cleft of the sheet metal-formed actuating lever, the block being adjustable lengthwise between forward and rearward positions in the cleft to provide varying amounts of lateral support between the pivots in operation.

4,505,039

SEAMING TOOL FOR FLOOR COVERINGS

James P. Donovan, 4975 N. Ardmore St., Whitefish Bay, Wis. 53217

Filed Aug. 3, 1983, Ser. No. 520,017
Int. Cl.³ B26D *7/20*, *7/16*; B43L *7/00*
U.S. Cl. 30—289 **4 Claims**



1. A seaming tool for use in laying floor covering, comprising,

elongated rectangular upper and lower plates each having a long edge connected to the other by means of a hinge so the plates can be opened and closed,

stop means fixed on the bottom of the lower plate to position the hinge parallel to the free edge of the already laid material on which the bottom plate is positioned with the stop means engaging said free edge of the material,

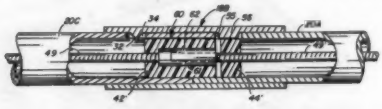
the free long edge of the upper plate being parallel to and spaced from the hinge so the edge of material cut along said free long edge of the upper plate will be parallel to and abut the free edge of the already laid material under the lower plate.

4,505,040

COUPLING FOR INTERCONNECTING TWO HANDLE PORTIONS OF A POWER DRIVEN IMPLEMENT

Robert G. Everts, 7125 W. Galveston, Chandler, Ariz. 85224

Continuation-in-part of Ser. No. 413,521, Aug. 31, 1982, Pat. No. 4,463,498. This application Nov. 9, 1983, Ser. No. 549,804
Int. Cl.³ A01D *50/00*
U.S. Cl. 30—296 R **11 Claims**



1. A handle held elongated power driven implement having a handle shaft formed by first and second separable and engagable handle shaft parts, a drive head mounted at the distal end of said first handle shaft part, an engine mounted at the distal end of said second handle shaft part, and means for operatively joining said engine to said drive head, the improvement comprising:

a releasable coupling means for joining the other ends of said first and second handle shaft parts together;

said releasable coupling means being constructed so that the other end of one of the handle shaft parts is positionable independently of and interlocking with the other end of the other of said handle shaft parts and comprising a split clamp surrounding and securely clamping the other ends of the juxtapositioned handle shaft parts in abutment with each other;

said coupling means being provided with a stop means on its internal periphery;

one of the other ends of the handle shaft parts being provided with a slot extending longitudinally inwardly thereof for telescopically engaging with said stop means when engaging with the other end of the other handle shaft part within said coupling means; and

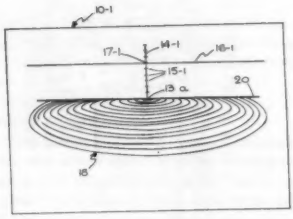
fastening means for releasably clamping said split clamp around the abuting ends of said first and second handle shaft parts.

4,505,041

PERSPECTIVE DRAWING TEMPLATES

Bill H. Keeney, 10946 Bloomfield St., No. Hollywood, Calif. 91602

Continuation of Ser. No. 206,693, Nov. 14, 1980, abandoned. This application May 25, 1982, Ser. No. 381,956
Int. Cl.³ B43L *13/14*
U.S. Cl. 33—1 K **20 Claims**



1. A template for producing a lined grid field on an overlaying drafting sheet and from which production a visually accu-

rate perspective view is structured on the drafting sheet and comprising

a sheet of material having physical boundaries,

a pattern of portions on non-concentric ellipses mounted on said sheet within its physical boundaries and having a common center,

a base point mounted within said physical boundaries at said common center,

a vertical measuring line mounted on said sheet and being operatively connected to said base point,

a horizon line mounted on said sheet and intersecting said vertical measuring line,

the geometrical major axes of said ellipses being parallel to one another and spaced from said horizon line,

said axes not being disposed between said base point and horizon line,

whereby one or more vanishing points can be selected on said horizon line and from which with said base point ultimately produce lines forming the lined grid field.

4,505,042

DIMENSION MEASURING INSTRUMENT

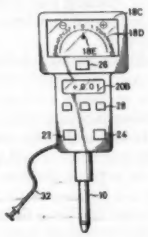
Shingo Nishina, Kawasaki, Japan, assignor to Mitutoyo Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 598,080

Claims priority, application Japan, Apr. 19, 1983, 58-68988

Int. Cl.³ G01B *3/22*

U.S. Cl. 33—172 E **9 Claims**



1. A dimension measuring instrument comprising:

an encoder for converting a displacement of a spindle into an electric signal;

an analogue indication device for electrically indicating a measured value obtained through processing of an output from said encoder, said analogue indication device electrically indicating the measured value by a pattern including at least one scale and a pointer;

a scale indicating circuit included in said analogue indication device, said scale indicating circuit indicating at least one scale having different scale intervals in one scale row; and

a pointer indicating circuit included in said analogue indication device, said pointer indicating circuit driving said pointer in accordance with said measured value and depending on the scale intervals for the indication;

whereby a range of dimension indication is expanded without deteriorating the reading accuracy within a predetermined range of dimension indication.

4,505,043

HEIGHT MEASUREMENT GAGE FOR MULTIFOCAL LENSES

Stanley Sztuka, 190-525 Riverleigh Ave., Riverhead, N.Y. 11901

Filed Dec. 3, 1982, Ser. No. 446,766

Int. Cl.³ A61B *3/10*

U.S. Cl. 33—174 A **1 Claim**

1. Apparatus for accurately measuring the height of the pupil above the lower frame of eyeglasses of the type containing lenses and having a frame about the periphery of the lenses, comprising:

(a) a first transparent plate having a lower edge which is positioned to rest on the lower frame of the eyeglasses, the first transparent plate also being positioned generally parallel to the position of the eyeglass lens when later installed,

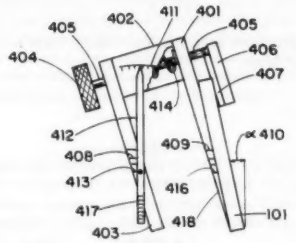
(b) a second transparent plate positioned generally parallel to the first plate and adjacent thereto, but separated therefrom and the second transparent plate being positioned forward of the first plate and frame, which is in a direction away from the pupil to be measured,

(c) spacer means for supporting and spacing the first and second transparent plates apart, while maintaining their generally parallel position with respect to one another,

(d) a generally vertically oriented scale means located on the first transparent plate for determining the heights of the pupil above the lower portion of the eyeglass frame,

(e) alignment means on the first and second transparent plates to align the eye of the operator taking the measurement in a horizontal plane passing through an area about the center of the pupil to be measured, and

(f) clamp means for securing said apparatus to the glasses by



detachably clamping the two together, said clamp means comprising:

(1) a first shaft passing through and rotatable within said spacer means in a direction orthogonal to the frame and lenses of the glasses,

(2) a third plate connected to the first shaft at the end adjacent the glasses and positioned to be rotated with the shaft to fall behind the lens and adjacent to the pupil to be measured to hold said apparatus to the glasses by means of said third plate,

(3) a spring means located within said spacer means, said spring means being connected to said first shaft and said spacer means to urge said third plate against the frame and lenses and thereby secure said apparatus to the glasses, and

(4) a knob connected to the first shaft on the end opposite the third plate to facilitate manual rotation of the third plate by means of the shaft, rotation of the third plate in a direction away from the frame and lens releasing said apparatus from the glases, while rotation towards and behind the frame secures said apparatus to the frame of the glasses.

4,505,044

DRAWING AID WITH INTERCHANGEABLE INSERT

Nader Shafii-Rad-G., P.O. Box 2284, Stanford, Calif. 94305

Continuation of Ser. No. 301,656, Sep. 14, 1981, abandoned. This application Sep. 12, 1983, Ser. No. 531,578

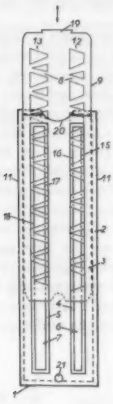
Int. Cl.³ B43L *13/02*

U.S. Cl. 33—174 B **3 Claims**

1. A drawing aid for drawing broken lines without lifting a drawing tool comprising:

(a) an interchangeable pattern insert between 0.1–1.0 mm thick comprising regularly spaced triangles; and

(b) means for supporting said pattern insert wherein said pattern insert and said supporting means form a three-



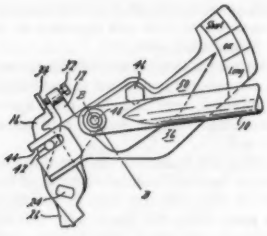
layer structure such that the bottom layer is thinner than the top layer.

4,505,045

THROTTLE VALVE LINKAGE ADJUSTMENT GAUGE AND METHOD THEREFOR

Raymond Stocker, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 249,578, Mar. 30, 1981, Pat. No. 4,422,242.
This application Sep. 27, 1982, Ser. No. 423,974
Int. Cl.³ G01B *5/00, 5/25*
U.S. Cl. 33—181 AT **10 Claims**



1. A gauge for adjusting the alignment of attachments comprising:

a first lever pivotably mounted at a first pivot and carrying a first attachment;

a gauge plate at least partially supported on the first lever at the first attachment carrying a pointer pivotably mounted about a second pivot, the pointer carrying a second attachment spaced radially from the second pivot and an indicator arm extending radially from the second pivot for indicating on the gauge plate the angular position of the second attachment about the second pivot; and

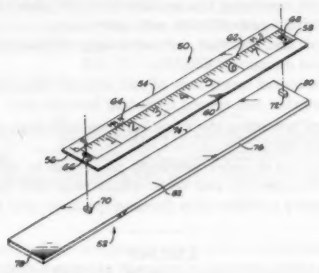
means for adjusting the angular position of the first attachment about the first pivot.

4,505,046

PRE-PRESS MAKEREADY SCALE FOR ROTARY PRESSES

Leonard G. Shonka, Glendale, Calif., assignor to Systems and Methods, Inc., Los Angeles, Calif.

Filed May 16, 1983, Ser. No. 495,138
Int. Cl.³ B41B *1/00*
U.S. Cl. 33—184.5 **3 Claims**



1. A portable pre-press makeready scale for accomplishing the setting of adjustable mechanisms at stations having lateral widths of a rotary offset printer wherein the functions of printing, punching, perforating, binding and cutting or any combination thereof are to be performed to print and finish a series of a single document comprising:

a single elongated guide containing visable preselected code symbol settings located at predetermined positions for setting the functions necessary to form said single document; said guide having indexing holes;

a reusable elongated holder including indexing projections to mate with the indexing holes of said guide to releasably hold said single guide in place thereon; and

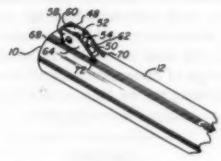
said holder and guide are of lengths to interfit within the lateral width of a station and once the adjustments of the mechanism at that said station are made corresponding to a particular code symbol setting said holder and guide may be moved to interfit within subsequent stations for appropriate mechanism settings against other of said code symbols.

4,505,047

FRONT SIGHT FOR SMALL ARMS

Ronald E. Elbe, 1315 W. 57 St., Davenport, Iowa 52806

Filed Aug. 3, 1978, Ser. No. 930,827
Int. Cl.³ F41G *1/02*
U.S. Cl. 33—233 **1 Claim**



1. A front sight for small arms having side vanes for shading the sighting surface from undesirable reflections with ramps to prevent the sight from snagging, said sight comprising:

a vertical blade extending logitudinally along the top surface of the barrel of said small arms near the muzzle end thereof, said blade having a rear sighting surface extending upwardly and terminating in an upper transverse horizontal sighting edge,

said rear sighting surface extending upwardly and rearwardly thereby forming an undercut sight,

a pair of ramps of uniform thickness one of which is at each end of said sighting edge extending downwardly from and rearwardly of said sighting surface, said ramps terminating in abuttment with said top surface of said barrel,

said blade having a base for attachment to said top surface of said barrel, said base extending between said ramps along the lower edges thereof,

said ramps forming the sides of a U-shaped vane, said vane being adapted to fit around the forward surface and extending along and against the side surfaces of said blade, and

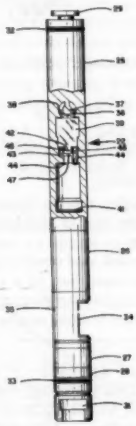
means securing said ramps of said vane to the side surfaces of said blade.

4,505,048

BOREHOLE SURVEY INSTRUMENT

Harper E. Sharp, Houston, Tex., assignor to Wilson Industries, Inc., Houston, Tex.

Filed Dec. 3, 1982, Ser. No. 446,628
Int. Cl.³ E21B 47/022; G01D 9/42
U.S. Cl. 33—313 **13 Claims**



1. A well survey instrument for recording selected wellbore parameters comprising:

elongated housing means adapted to be passed through a wellbore;

indicating means disposed within a transparent liquid and mounted to move within the housing means;

photographic recording means fixed within the housing means and axially displaced in one direction from the indicating means to move with the housing means relative to the indicating means;

indicia disposed on the indicating means facing the photographic recording means for indicating the angular position of the housing means relative to the indicating means;

optical means for focusing the reflected image of the indicia on the photographic recording means to record the attitude of the housing means with respect to the indicating means, said optical means including a transparent body formed of a solid material extending from the transparent liquid to a curved surface formed on the transparent body and forming at least one lens for focusing the reflected image of the indicia on the photographic recording means; and

light source means disposed in the housing adjacent said transparent body near said at least one lens such that the light from the light source means will propogate through the transparent body and the transparent liquid to illuminate said indicia.

10. A well survey instrument for recording selected wellbore parameters comprising:

elongated housing means adapted to be passed through a wellbore, said housing means including a tubular section forming the peripheral wall of a liquid chamber, and having axially aligned first and second bores;

a first wall member having a cylindrical portion inserted in the first bore to form one wall of the liquid chamber, the first wall member including a centering post extending into the liquid chamber and having an axis aligned with the axis of the cylindrical portion;

a second end wall member formed of optically transparent material having a cylindrical portion inserted in the second bore to form the other end wall of the liquid chamber, the second end wall member including an optical axis aligned on the longitudinal axis of the cylindrical portion;

means for centering the cylindrical portions of the respective end wall members in the respective bores of the tubular sections;

a liquid in the liquid chamber; and

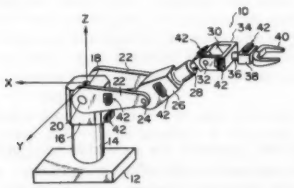
indicator means having indicia thereon floating in the liquid and centered along the longitudinal axis of the centering post by the centering post whereby the indicia on the indicator means and the optical axis of the lower end wall member will be automatically aligned on a common longitudinal axis within the machine tolerances of the bores and ends walls upon assembly of the instrument.

4,505,049

METHOD OF MEASURING ORIGIN OF MOVING SECTION IN ROBOT AND APPARATUS THEREFOR

Toshitaka Kuno, Nagoya, and Toshiaki Ikeda, Toyota, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jan. 26, 1983, Ser. No. 461,232
Claims priority, application Japan, Feb. 2, 1982, 57-15202
Int. Cl.³ G01C 9/06
U.S. Cl. 33—333 **15 Claims**



1. A method of measuring the origin of movable arm elements with respect to a reference coordinate system of a robot having a robot arm including a base, a first movable arm element having a longitudinal axis and coupled to said base for rotation about an axis perpendicular to said longitudinal axis, and at least one second movable arm element coupled to said first movable arm element for rotation about an axis, said method comprising the steps of:

forming a mounting structure at a predetermined position on said movable arm element such that said mounting structure extends in a direction perpendicular to said longitudinal axis and is mounted to said first movable arm element in a plane perpendicular to the axis of rotation of said first movable arm element;

orienting said first movable arm element such that the axis of rotation of said first movable arm element extends horizontally and defines an origin with respect to said reference coordinate system;

mounting a sensor to said mounting structure for detecting an angle of inclination of said first movable arm element

about said axis of rotation of said first movable arm element and with respect to said origin; and

rotating said first movable arm element about said axis of rotation of said first movable arm element in response to a detected angle of inclination to position said first movable arm element at said origin.

4,505,050

DRYING APPARATUS FOR METALLIC BELT PROCESSED IN A FLUID

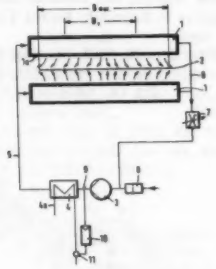
Helmut Jung, Hagen; Franz G. Pempera, Neuwied, and Udo Riedesel, Iserlohn, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,840

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1982, 3208408

Int. Cl.³ F26B *13/00*

U.S. Cl. 34—54 **8 Claims**



8. A drying apparatus for a metallic belt having been processed by passing through a fluid comprising:

(a) a pair of blower systems opposed to one another and arranged above and below the belt to be dried;

(b) said blower systems having a full hot air drying width extending at least as wide as the width of the greatest belt to be dried by the apparatus;

(c) said blower systems are provided with a plurality of air exiting slits extending across the full hot air drying width and positioned to face the belt;

(d) an air blower for directing a flow of air to said blower systems capable of treating said full hot air drying width;

(e) a heat exchanger located between said air blower and said blower systems for heating said air to a predetermined temperature prior to its introduction into said blower systems;

(f) means to selectively adjust the effective hot air drying width according to the actual width of said belt to be dried; and

(g) said air blower being of the constant volume type and being selectively adjustable in accordance with the means to adjust the effective hot air drying width and the width of the belt to be dried.

4,505,051

CYCLONE HEAT EXCHANGER INCLUDING SEGMENTED IMMERSION PIPE

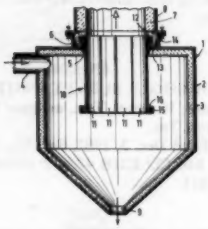
Horst Herchenbach, Hennef; Fritz Seelen; Hubert Ramesohl, both of Bergisch Gladbach; Peter Hündgen, Euskirchen, and Horst Schilling, Cologne, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Aug. 1, 1983, Ser. No. 519,370

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1982, 3228902

Int. Cl.³ F26B *17/14;* **B01D** *45/12;* **B04C** *5/085*

U.S. Cl. 34—57 E **9 Claims**



1. A cyclone heat exchanger particularly adapted for direct heat exchange between a granular product and hot exhaust gases from a kiln used in the production of cement comprising:

a housing,

a gas feed pipe connected to the upper portion of said housing and arranged to introduce gas tangentially into the interior of said housing,

a cover extending across the top of said housing,

discharge means at the base of said housing for discharging product therefrom,

a pipe extending through said cover and immersed into said housing, said pipe consisting of a plurality of segments extending in the longitudinal direction of said pipe, and

hanger means releasably holding said segments in said cover.

4,505,052

AIR BLAST APPARATUS FOR THE DRYER SECTION OF A PAPER MAKING MACHINE

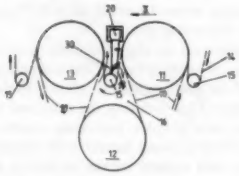
Manfred Osswald; Hanns Rau, and Hans-Joachim Fissmann, all of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith, GmbH, Heidenheim, Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 495,834

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220076

Int. Cl.³ F26B *11/02*

U.S. Cl. 34—114 **11 Claims**



1. Air blast apparatus for a dryer section of a paper making machine having a plurality of tiers of drying cylinders comprising an upper tier and a lower tier for having a paper web trained therethrough, an endless gas-permeable support band urged against the paper web while the paper web is trained over the drying cylinders in the upper and lower tiers, a pocket formed generally by run-off and run-on portions of said paper

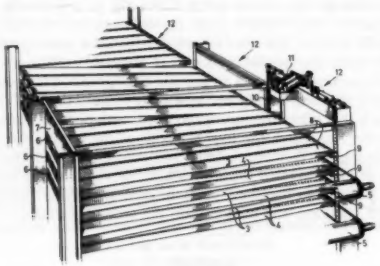
web as said paper web passes from a first drying cylinder of one of said tiers to a drying cylinder of the other of said tiers and from said drying cylinder of said other of said tiers to a second drying cylinder of said one of said tiers, guide roller means situated generally between said first and second drying cylinders, said pocket being also formed by said endless support band as it passes from said first drying cylinder about said guide roller means and to said second drying cylinder, said air blast apparatus comprising air blast housing means situated as to extend transversely to the running direction of said endless support band, blow orifice means carried by said air blast housing means, said blow orifice means comprising a continuous ring slot orifice, said continuous ring slot orifice circumscribing a generally centrally situated land portion which is free from any additional blow orifice means, said continuous ring slot orifice comprising first and second longitudinal slot portions extending generally transversely of the running direction of said endless support band, said first longitudinal slot portion being the first of said longitudinal slot portions traversed by said support band in the running direction of said support band, said second longitudinal slot portion being the second of said longitudinal slot portions traversed by said support band in the running direction of said support band, the blow direction of said first longitudinal slot portion being generally normal to the running direction of the support band running therepast, and the blow direction of said second longitudinal slot portion being at an obtuse angle with respect to the running direction of the support band running therepast.

4,505,053

DRYING PLANT FOR A MATERIAL WEB

Karl-Hugo Andersson; Ingemar Karlsson, both of Växjö , Sweden, and Rolf Quick, Ottawa, Canada, assignors to Flakt AB, Nacka, Sweden

Filed Sep. 30, 1982, Ser. No. 429,233
Claims priority, application Sweden, Oct. 19, 1981, 8106152
Int. Cl.³ F26B *13/20*
U.S. Cl. 34—155 **11 Claims**



1. A plant for drying a material web by two-sided blowing, said plant comprising:

(a) a plurality of lower blow boxes which support the material web during use of the plant, said lower blow boxes being provided with orifices for blowing air substantially exclusively in directions which are generally opposite to one another and substantially in parallel to the plane of the material web, the air ejection velocity being sufficient to maintain the material web at a specified floating height above said lower blow boxes during use of the plant and the material web being stabilized at a definite floating position of said lower blow boxes due to the fact that air currents blown out between the upper surface of said lower blow boxes and the lower surface of the material web and parallel to both surfaces give rise to a force pulling the surfaces towards each other until the distance between the two surfaces becomes so small that the pressure drop due to the flow of the air is in equilibrium with the force of attraction;

(b) a plurality of upper blow boxes situated on the opposite side of the material web from said lower blow boxes, said upper blow boxes being provided with orifices having a diameter (d) for blowing air substantially exclusively at right angles to the plane of the material web;

(c) first means for adjusting the distance (H) from the orifices in said upper blow boxes to the material web so that the ratio (H/d) between the distance (H) and the diameter (d) is an optimal heat transfer coefficient (α); and

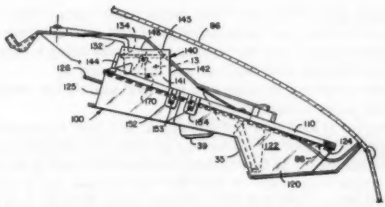
(d) means for generating a specific airflow (g) through said upper blow boxes such that the relative energy requirement ($\Delta N/\Delta e$) expressed in KWh/kg H_2O, which is the ratio of the change in energy requirement for generating a certain air flow to the change in specific evaporation, is less than or equal to one, whereby the energy consumption per unit weight of evacuated liquid is substantially equal to what it would be for single-sided blowing.

4,505,054

MAGNETIC SENSOR MOUNTING SYSTEM

Russell L. Clark, Zeeland, and David E. Nestell, Wyoming, both of Mich., assignors to Prince Corporation, Holland, Mich.

Filed May 25, 1983, Ser. No. 498,104
Int. Cl.³ G01C *17/28*
U.S. Cl. 33—357 **21 Claims**



1. A mounting structure for a magnetic field sensor and a display means for use in a vehicle compass system comprising:

a magnetic field sensor normally stationary with respect to a vehicle on which it is mounted for creating electrical signals in response to the position of said sensor in relation to the earth's magnetic field;

a digital display means responsive to said electrical signals for displaying the vehicle heading in response to said electrical signals;

a mounting assembly for supporting said magnetic field sensor in a pivotally adjustable position with respect to a vehicle; and

means for pivoting the magnetic sensor secured to said mounting assembly to a predetermined adjusted position when said mounting assembly is attached to the vehicle, said means providing pivotal adjustment of said magnetic sensor independent of said display means whereby said mounting structure can be utilized in different vehicles by adjusting said position of said sensors independently of the position of said display means.

4,505,055

SHOE HAVING AN IMPROVED ATTACHMENT OF THE UPPER TO THE SOLE

Charles Bergmans, Sprang Capelle, Netherlands, assignor to Clarks of England, Inc., Kennett Square, Pa.

Filed Sep. 29, 1982, Ser. No. 426,271
Int. Cl.³ A43B *9/02, 13/28*
U.S. Cl. 36—18 **12 Claims**

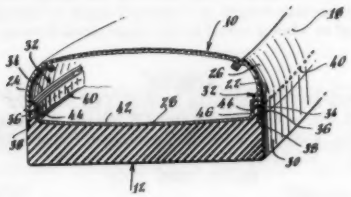
1. A shoe for a human foot comprising:

an upper including a heel portion, a toe portion and side

portion, said heel, toe and side portions including at the bottom thereof a wall extending about the periphery of said upper, said upper comprising sheet material having a thickness, said wall having an interior surface and a terminal edge, said terminal edge having a thickness substantially equal to the thickness of said sheet material;

a sole having a generally horizontal upper surface for supporting said human foot, said sole having a sidewall extending about its circumference;

a lip projecting generally vertically upwardly from said upper surface, said lip including a generally vertical outer face and a generally vertical inner face, said inner face smoothly converging with said upper surface of said sole, said lip projecting upwardly from said upper surface a distance to provide lateral support for said foot, and said lip including a base;



a ledge projecting generally horizontally outwardly from said lip base, said terminal edge of said wall abutting said ledge and said interior surface of said wall being in face-to-face relation with said vertical face of said lip;

means extending through said wall and said lip for securing said upper to said sole; and

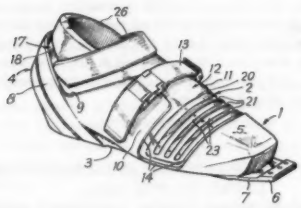
a liner for at least a part of said upper, said liner having at the bottom thereof a wall having an inner surface, said inner surface being in face-to-face relation with said generally vertical inner face of said lip, said means for securing including means extending through said lip said wall and said liner to secure the liner and the wall to the sole said edge having a depth and said terminal edge having a thickness substantially equal to said ledge depth to provide an upper that is substantially flush with said sole sidewall.

4,505,056

CROSS-COUNTRY SKI BOOTS

Charles Benéteau, Pouzauges, France, assignor to Patrick S.A., Pousauges, France

Filed Feb. 1, 1983, Ser. No. 462,890
Claims priority, application France, Feb. 5, 1982, 82 01911
Int. Cl.³ A43B 5/04
U.S. Cl. 36—117 **7 Claims**



1. Cross-country ski boot, wherein said boot comprises a shell in rigid plastic material, removably fittable over an inner shoe in supple material which is relatively thick for comfort and size-compensation, the upper part of said shell being entirely cut out in the area where the boot is required to bend at the same time as the metatarsus, substantially through to the outer sole, and the inner shoe, which is in closedpore wear-resistant foam, more densified in some parts than in others, comprising a thicker and compressible part which encloses the top of the foot and which presents, in upwardly facing relation to the metatarsal perforations of the shell, transverse grooves which also help antero-posterior bending.

4,505,057

SKI BOOT SOLE EXTENSION

Phillip D. Kiester, 781 W. San Bernardino, Covina, Calif. 91722

Filed Apr. 29, 1983, Ser. No. 490,048
Int. Cl.³ A43B 5/04
U.S. Cl. 36—117 **14 Claims**

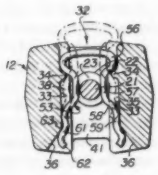
1. A ski boot having a relatively rigid sole structure and an upper structure for receiving the foot of the user, the sole being elongate having a length and a width generally corresponding to the length and width of the user's foot and having formed on the bottom thereof four portions, as follows: (a) a first portion adapted to rest on the top of a ski during skiing, said first portion being generally flat and lying approximately under the metatarsal and forward toward the toes of the user's foot when the user is skiing; (b) a second portion sloping in an arcuate configuration medially of the user's foot forwardly from the first portion and upwardly proximate the tip of user's toes during skiing; (c) a third portion sloping in a generally flat configuration rearwardly from the first portion toward and upwardly toward the user's heel at least to a point approximately under the medial malleolus of the user's ankle; and (d) a fourth portion sloping in an arcuate configuration laterally of the user's foot rearwardly and upwardly toward the heel of the user such that when the user walks the fourth portion normally strikes the floor first; the four portions of the bottom forming a continuous surface constructed and configured such that the center of force applied during walking moves laterally on the fourth portion to the third portion, centrally along the third and first portions, and medially on the second portion.

4,505,058

EXCAVATING TOOTH, HOLDER AND RETAINER

Gerald A. Peterson, 37 Sullivan Dr., Moraga, Calif. 94556

Continuation-in-part of Ser. No. 445,971, Jan. 6, 1983, abandoned. This application Feb. 8, 1984, Ser. No. 578,201
Int. Cl.³ E02F 9/28
U.S. Cl. 37—142 A **3 Claims**



1. In combination, a flat forged excavating tooth having a

distal portion formed with a cutting point, said distal portion formed with a transverse first shoulder and a non-circular proximal portion, said proximal portion having a terminal button formed with a second shoulder and a reduced diameter spindle forward of said second shoulder, an adapter having a recess shaped to receive said proximal portion and said button and having a front edge bearing against said first shoulder to transfer the thrust on said tooth directly to said adapter, said adapter being formed with an opening having a pair of opposed straight walled grooves extending from a first face to the opposite second face of said adapter and each laterally offset from and communicating with said recess directly opposite said spindle and a projection in each said groove above said spindle extending inward toward said recess, the outside walls of said grooves being co-planar above and below said projections, and a reversible, round cross-secion, single piece resilient retainer, which is substantially co-planar and symmetric about its longitudinal center line, having an upwardly bowed top connector and a leg at either end depending from said connector and initially slanted outward, each said leg having a reverse bend joining said leg to said connector, an upper straight section opposite said spindle, an outward-downward slanted section, a lower section laterally-outwardly offset relative to said upper straight section and a lower terminal section, the width across said reverse bends and said lower sections being greater than the thickness of said button and the width across the upper straight sections being less than the distance between the inner edges of said projections, the distance between said upper straight sections being greater than said spindle and less than said button, said retainer being slidable in said grooves between a locked position with said upper straight sections straddling said spindle and an unlocked position with said lower sections opposite said spindle, said projections limiting movement of said retainer inward beyond locked position and outward beyond unlocked position by contacting said reverse bends and said outward-downward slanted sections, respectively, the opening in said grooves in said second face being formed with outward flares, each said retainer lower terminal section being curved outward to lock against one of said flares in the locked position of said retainer, each said lower terinal section being curved inward below the location where it is curved outward to facilitate initial insertion of said retainer legs into said grooves and past said projections, said retainer being positionable so that either of said legs may be inserted in either of said grooves.

4,505,059

ADVERTISING DISPLAY APPARATUS

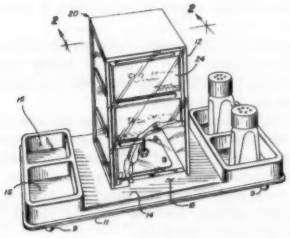
Stanley Morris, 13 Woodside Rd., Springfield, N.J. 07079

Continuation-in-part of Ser. No. 403,575, Jul. 30, 1982, Pat. No. 4,432,151. This application Aug. 26, 1983, Ser. No. 526,625

The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.

Int. Cl.³ G09F *3/18*

U.S. Cl. 40—10 D **14 Claims**



1. In combination:

a base;

a plurality of support members, removably mounted on said base, each support member facing in a different respective direction;

means for mounting at least one advertisement on each of said support members;

means mounting said support members for movement relative to said base to change the direction in which a given advertisement faces;

a hollow, transparent tube having a plurality of walls and constituting transparent cover means for enclosing and protectively covering said support members;

each support member and its respective advertisement facing a respective wall on said transparent tube;

said support members, when attached together, form a resilient, strip-like member having a first outer edge and a second outer edge; and,

said resilient, strip-like member is located within said tube and is resiliently deformable between an expanded, open first condition and a second condition in which said first edge and said second edge are substantially adjacent to each other and said strip-like member is at least partially closed for urging the advertisement toward its respective wall on the transparent tube.

4,505,060

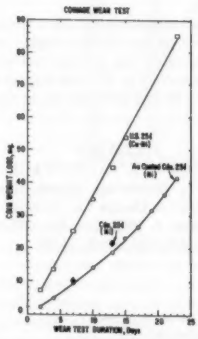
PROCESS FOR OBTAINING A COMPOSITE MATERIAL AND COMPOSITE MATERIAL OBTAINED BY SAID PROCESS

James A. E. Bell; Bruce R. Conard, both of Oakville, and Douglas A. Hope, Mississauga, all of Canada, assignors to Inco Limited, Toronto, Canada

Filed Jun. 13, 1983, Ser. No. 503,679

Int. Cl.³ B32B *15/02*

U.S. Cl. 40—27.5 **8 Claims**



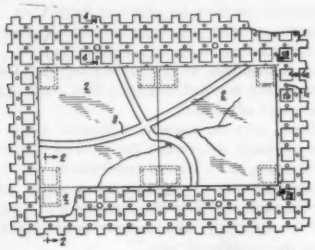
1. A composite coin comprising a base having at least two opposing surfaces of nickel and bearing on each of said surfaces a layer of about 0.1 μm up to about 2.5 μm thick of gold metallurgically bonded to said nickel base, said gold layer having been electrodeposited on each of said nickel surfaces and having present therein an amount of diffused nickel originating from said nickel of said base sufficient to increase the hardness of said gold layer but insufficient to significantly destroy the distinctive color of said gold layer.

4,505,061

GRAPHIC DISPLAY

Werner Neuburger, West Nyack, and Martin P. Gabor, Tuxedo Park, both of N.Y., assignors to Datapic Systems, Inc., West Nyack, N.Y.

Filed May 9, 1983, Ser. No. 492,702
Int. Cl.[3] G09F 11/00
U.S. Cl. 40—489 4 Claims



1. A sign, comprising:

a. an array of individually replaceable display members constituting said sign when placed in a coordinated abutting relationship, each display member comprising a base sheet, a display sheet carrying a portion of the sign and a transparent cover sheet, said sheets being bonded together with the display sheet between the base sheet and the cover sheet;

b. a frame comprising a rectangular grid of elements having flat front surfaces, said grid defining an array of apertures of equal size, each said aperture being rectangular and being defined by four grid elements;

c. a plurality of mounting units, each comprising a rectangular plate wide enough to overlap the grid elements on each side of one of said rectangular apertures, and having four walls projecting rearwardly from the plate and integral therewith to engage the four grid elements defining the aperture, at least two of said walls having flexible fingers integral therewith and projecting through holes in the grid elements, said fingers being yieldable to grip the grid elements and hold the mounting unit in place on the frame with the member spaced from the grid by the walls on the mounting units;

d. the plate on each mounting unit has a front surface bonded to the base sheet on one of said display members; and

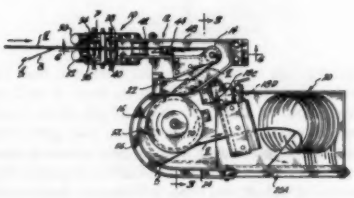
e. each display member has at least one mounting unit attached to its base sheet so that the display member may be readily attached to and removed from the frame.

4,505,062

LONGLINE HAULING AND STOWAGE APPARATUS

Harold T. Cook, Jr., Bainbridge Island, Wash., assignor to Marine Construction & Design Co., Seattle, Wash.

Filed Aug. 5, 1982, Ser. No. 405,345
Int. Cl.[3] A01K 91/00
U.S. Cl. 43—6.5 43 Claims



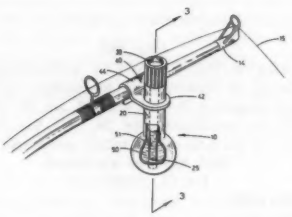
1. Apparatus for stowing longline, said longline including a ground line and successively spaced gangions thereon having hooks on the gangions, said apparatus being operable to stow said long line for resetting while hauling such longline, said apparatus comprising longline stowage means including line-dispensing stowage container means adjoined by hook dispensing track means defining a final portion of a hook advancement path and adapted to receive and slidably retain hooks advancing successively into stacked relationship thereon during stowing of the longline in the container means, longline hauler means including a power-driven sheave operable to engage and advance the incoming ground line along an initial portion of said path of advancement toward said container means, means guiding the ground line in relation to such sheave to establish an arc of tractional engagement of the ground line with said sheave, said hauler means including a hook control means with a guide track defining an initial portion of said hook advancement path, said hook control means being adapted to receive and guide the hooks drawn along said guide track by such ground line advancement, and longline transfer means interposed between said hauler means and said stowage means, said transfer means comprising elongated, mutually parallel, substantially cylindrical coacting line gripping rollers, mounting means supporting such rollers one above the other and extending generally horizontally across said final portion of said ground line advancement path, power drive means for rotating at least one of said rollers to draw and advance the ground line transversely through the nip of the rollers intermediate the ends thereof, the nip of the rollers being open at their ends opposite said mounting means to pass the gangions stretched between the advancing longline and the hooks being drawn by their respective gangions along said hook advancement path, said apparatus further including means to guide the hooks to pass successively from said hauler means guide track to said hook dispensing track means.

4,505,063

NIGHT FISHING SIGNAL

Donald L. Price, 516 E. Roberts, and Van A. Nechvatal, 2631 E. Fremont, both of Fresno, Calif. 93710

Filed Apr. 29, 1983, Ser. No. 490,193
Int. Cl.[3] A01K 87/02
U.S. Cl. 43—17 3 Claims



1. A night fishing signal for use with a fishing pole and comprising:

A. a generally tubular outer container for a first chemiluminescent reactant, such container being constructed of flexible, light transmitting material and having an open end and an opposite end;

B. a generally tubular inner container for a second chemiluminescent reactant, such inner container having an open end and an opposite end and being receivable within the outer container and being constructed so as to open between such ends when the inner container is received in the outer container and the outer container is flexed to engage the inner container;

C. a plug having a first portion receivable in fluid-tight relation on the open end of the outer container and a second portion disposed centrally of such first portion and receivable in fluid-tight relation on the open end of the

inner container with the plug supporting the inner container within the outer container when such portions of the plug are received on the corresponding open ends of the containers; and

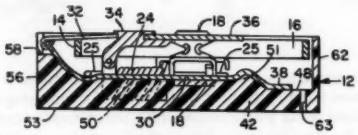
D. a clip having one portion fixedly connected to the outer container and having a recurved portion of resilient material configured detachably to clamp on the pole when the pole is received in such recurved portion.

4,505,064

TRAP BOOT

John D. Smagner, 109 South Ave., Watkins, N.Y. 14891

Filed Feb. 7, 1983, Ser. No. 464,688
Int. Cl.³ A10M *23/26*
U.S. Cl. 43—96 **7 Claims**



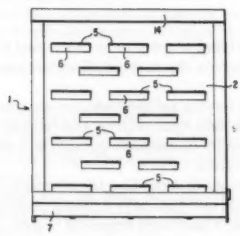
1. A boot for use in combination with an animal trap having a frame, a pair of jaws rotatably mounted on said frame, a pan located between said jaws when said jaws are in the set position, spring means on said frame to urge said jaws toward eachother from a set position, means pivotally mounting said pan on said frame, and a dog adapted to contact said pan and hold said jaws in the set position, said boot comprising a floor of resilient material situated beneath substantially the entire animal trap, and a relatively thin sidewall connected to the periphery of said floor and extending above said floor around the major portion of the periphery of said trap including said jaws when said jaws are in the set position, there being no rigid connection between said boot and any part of said trap, whereby said trap is able to jump upwardly from said boot when snapped.

4,505,065

INSECT TRAP

Hans Niemeyer, Blankenhagen, Fed. Rep. of Germany, assignor to Niedersächsischer Minister für Ernährung, Landwirtschaft und Forsten, Hannover, Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,345
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3231232; Feb. 5, 1983, 3303889
Int. Cl.³ A01M *1/10*
U.S. Cl. 43—107 **19 Claims**



1. A trap for catching flying insects, comprising:

(a) a hollow body adapted to accommodate a dispenser with insect-specific attractant and defined at least in part by a wall structure oriented vertically during use;

(b) a plurality of apertures provided in said wall structure and distributed substantially over the entire area thereof; each said aperture being bounded by a lower edge forming part of said wall structure;

(c) a separate, flap-like projection associated with each said aperture; each projection being affixed to said wall structure and extending from each said lower edge obliquely upwardly and away from said hollow body; each said projection having an upper surface oriented towards said wall structure and sloping downwardly towards the aperture associated therewith; each said upper surface having an abutment-free transition into said lower edge of the respective aperture, whereby insects colliding with said wall structure and falling downward are guided by said upper surface into the inside of said hollow body through the associated aperture; and

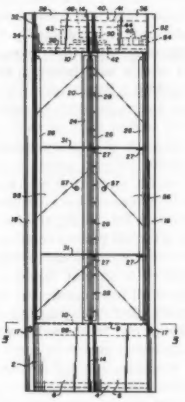
(d) at least one collecting vessel supported by said hollow body at a lower portion thereof for collecting insects entering said hollow body through said apertures; said collecting vessel being covered by smooth, sloping surfaces guiding the insects falling thereon after their passage into said hollow body; said sloping surfaces of said collecting vessel defining, at a lower portion thereof, a one-way opening for admitting insects into said collecting vessel.

4,505,066

INDOOR GREENHOUSE

Patrick D. Moore, S.S. #1, Kamloops, British Columbia, Canada V2C 5N6

Filed Jun. 16, 1982, Ser. No. 388,822
Claims priority, application Canada, Mar. 15, 1982, 398297
Int. Cl.³ A01G *9/00*
U.S. Cl. 47—17 **6 Claims**



1. A housing comprising:

(a) a frame having:

(i) a base with a lower surface;

(ii) a plurality of elongated support members connected to the base so as to extend therefrom perpendicular to the lower surface, and transversely spaced apart to define all the alternate apices of a first, substantially regular polygon perpendicular thereto;

(iii) a top connected between a top end of each of the support members;

(b) a plurality of pairs of rectangular doors, each pair dimensioned so that when both doors thereof are in a closed position, the pair extends between the base, the top, and a corresponding pair of adjacent support members, and perpendicularly through respective adjacent sides of the first polygon; and

(c) connecting means attached to said frame for removably connecting said pairs of doors thereto so that a corresponding pair extends between each pair of adjacent sup-

port members when both door sections of the pair are in the closed position, and so that each door is moveable between an open and a closed position, and said connecting means comprising a slotted upper end surface and lower end surface respectively, of the members of the base and top side portions, the slots extending the entire length of the slotted end surfaces and dimensioned to accommodate respective doors;

(d) socket means connected to the support members for mounting each of a plurality of light tubes vertically along an inner surface of a corresponding support member.

4,505,067

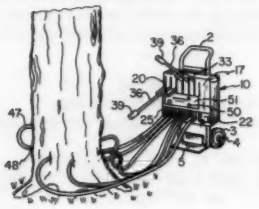
APPARATUS FOR HYDRAULIC TREE INJECTION

John L. Gillespie, R.D. #1, Box 223-1, Scottdale, Pa. 15683

Filed May 23, 1983, Ser. No. 496,852

Int. Cl.³ A01G *29/00*

U.S. Cl. 47—57.5 **19 Claims**



1. A portable unitary hydraulic injection apparatus having a housing, a liquid reservoir located within said housing, a plurality of independent suostantially closed cylinders mounted within said housing, separate inlet means for each of said cylinders located within said housing, means located within said housing providing a liquid connection between said reservoir and said inlet means for each of said cylinders, a reciprocable piston located within each of said cylinders, of reciprocable piston rod for each of said cylinders having a lower end attached to a piston located within a cylinder and extending out of the upper end of a cylinder with an upper end located above each of said cylinders, means attached to the upper end of each of said piston rods for raising and lowering each of said piston rods and said attached pistons relative to each of said cylinders, independent outlet means located within said housing for each of said cylinders to permit liquid to flow out of each said cylinders, an outlet hose connected with each of said independent outlet means and extending out of said housing for receiving liquid discharged from said independent outlet means of each of said cylinders and an injector at the end of each of said outlet hoses, whereby upward movement of said pistons draws liquid from said reservoir into each of said cylinders and downward movement of said pistons forces liquid out of said outlet means of each of said cylinders and through said outlet hoses and said injectors.

4,505,068

HYDROPONIC METHOD AND APPARATUS FOR CULTIVATING VEGETABLES AND OTHER PLANTS

Toshiro Kaneko, 1397 Obama, Yaizu-shi, Shizuoka-ken, Japan

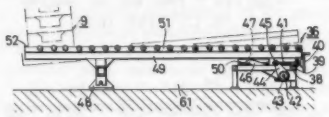
Filed Feb. 18, 1983, Ser. No. 467,818

Claims priority, application Japan, Feb. 20, 1982, 57-26523

Int. Cl.³ A01G *31/02*

U.S. Cl. 47—59 **20 Claims**

1. A water cultivation apparatus for sprouting seeds and growing young plants comprising: a cultivation housing having a cultivation start region and a cultivation ending region, said cultivation start region being effective to promote the growth of stalks and roots of young plants from seeds, and said cultivation ending region being disposed adjacent the cultivation start region and being effective to deepen the green color of the leaves of the young plants; a plurality of cultivation containers dimensioned to be stored and transported within the cultivation housing, each cultivation container having cultivation rooms for receiving seeds and for growing young plants from the seeds within the cultivation rooms and being configured to be stackable one atop another; said cultivation start region comprising an adjustable cover for adjustably limiting the amount of light to the young plants grown in the cultivation containers, a plurality of cultivation stands arranged in series for holding the cultivation containers in a stacked condition, a plurality of transfer stands for transferring the cultiva-



tion containers in a non-stacked condition serially from one condition stand to the next, and a device for supplying cultivation liquid to the young plants within the cultivation containers while the same are in the non-stacked condition on the transfer stands to effect the growth of the stalks and roots of the young plants; said cultivation ending region comprising a water pool for holding the cultivation containers in a flat non-stacked condition so that the young plants in the cultivation containers can receive sufficient light and for effecting movement of the cultivation containers therealong, and a supply apparatus to supply cultivation liquid to the cultivation containers in said water pool.

4,505,069

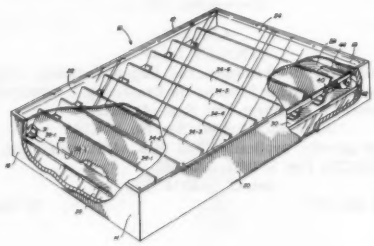
ANTI-INTRUSION SKYLIGHT BLIND

Delbert Freeman, 12634 Sun Valley Dr., Sun City, Ariz. 85351

Filed Feb. 18, 1983, Ser. No. 467,755

Int. Cl.³ E06B *7/08*

U.S. Cl. 49—64 **14 Claims**



1. A skylight blind adapted to be positioned in a light well of a skylight to impede the passage of an intruder therethrough comprising:

frame means having an open interior section adapted to be mounted in said light well so that visible light from the skylight can be transmitted through said interior section;

a plurality of slats;

means for pivotally mounting the plurality of slats in said frame so that said slats have a closed position in which the slats provide a maximum degree of obstruction to physical egress through said light well and to the transmission of visible light through the interior section of the frame means and an open position in which the slats provide a minimum degree of obstruction to the transmission of visible light through the interior section of the frame means while still providing physical impediment to physical intrusion;

means for pivoting said slats between their open position and their closed position; and

planar transparent and impact resistant means secured to the frame means, said transparent means and frame means forming an enclosure within which the slats and means for pivoting the slats are located, said transparent and impact resistant means further impeding physical intrusion through said light well.

4,505,070

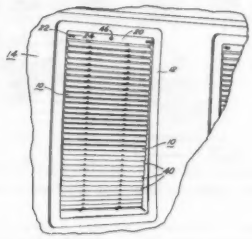
WINDOW BLIND

James L. Clipp, 69286 Garver Lake Rd., Edwardsburg, Mich. 49112, and Charles E. Stephens, Niles, Mich., assignors to James L. Clipp, Elkhart, Ind.

Filed Sep. 28, 1983, Ser. No. 536,682

Int. Cl.³ E06B *7/096*

U.S. Cl. 49—83 **5 Claims**



1. A window blind, having a window side and a room side, for controlling the amount of light admitted through a window or the like, comprising a plurality of horizontal slats on the room side of said blind, sequentially arranged in vertical alignment and selectively adjustable to positions substantially parallel with the window, positions substantially perpendicular to the window, and any of the various angular positions therebetween, relatively rigid vertical members having support elements pivotally secured thereto for supporting said salts and including vertically disposed channeled posts spaced apart at regular intervals and having toothed gear strips slidably mounted in the channel in the posts for vertical movement therein, and gear segments on said support elements meshing with teeth on the respective strip for positioning said slats, an elongated housing disposed at the top of said slats and parallel therewith, and means disposed in said housing for adjusting the position of said slats, including a rotatable adjustment handle projecting from said housing on the room side thereof, a worm gear secured to said handle for rotation therewith, a rotatable elongated bar parallel with said slats, a rotatable worm wheel engaging said worm gear and being disposed on said rotatable elongated bar, and gear wheels mounted on said bar for engaging said toothed gear strips and selectively moving said strips upwardly and downwardly upon rotation of said adjustment handle.

4,505,071

CRANKSHAFT-FINISHING MACHINE

Rudolf Schwär, Wuppertal, Fed. Rep. of Germany, assignor to Maschinenfabrik Ernst Thielenhaus GmbH, Wuppertal, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,683

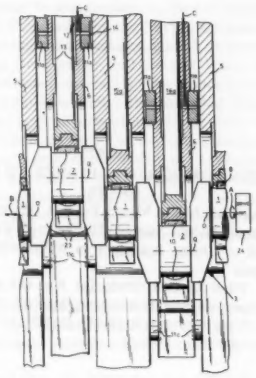
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242095

Int. Cl.³ B24B *5/42*

U.S. Cl. 51—3 **10 Claims**

1. In a machine for finish-grinding a crankshaft with axial and off-axial cylindrical sections interconnected by transverse webs, including drive means for rotating said crankshaft about a horizontal axis, primary tool carriers provided with first grinding means positioned for engagement with said axial sections, and secondary tool carriers provided with second grinding means positioned for engagement with said off-axial sections,

the improvement wherein said primary tool carriers are mounted on first holders secured in mutually fixed positions to a frame portion for supporting said crankshaft by said axial sections, said secondary tool carriers being mounted on second holders movably guided along parallel confronting surfaces of adjacent first holders for following the excursions of said off-axial sections.



4,505,072

CENTRIFUGAL ROTARY BARREL-TYPE FINISHING MACHINE

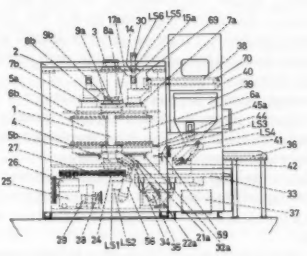
Hisamine Kobayashi, and Toshiro Ishihara, both of Nagoya, Japan, assignors to Shikishima Tipton Manufacturing Co., Ltd., Aichi, Japan

Filed Sep. 8, 1983, Ser. No. 530,344

Claims priority, application Japan, Sep. 17, 1982, 57-162871

Int. Cl.³ B24B *31/02*

U.S. Cl. 51—164.2 **4 Claims**



1. A centrifugal rotary barrel-type finishing machine including a high-speed turret carrying tubs or barrels rotating about their axes, wherein the machine comprises:

a plurality of upright tubs arranged at regular intervals circumferentially on the turret, each of the tubs having openings at the top and at the bottom;

automatic valve means capable of movement up and down and for thereby closing and reopening the top opening of the tub;

means for closing and reopening the bottom opening of the tub, including a combination of a bottom lid covering the opening and a hinged plate, said hinged plate being pivot-

ally supported at one end on one side of the tub bottom opening;

hook means pivotally supported at one end on the other side, for disengageably engaging said hinged plate.

4,505,073

APPARATUS FOR SORTING POWER TRANSMISSION BELTS

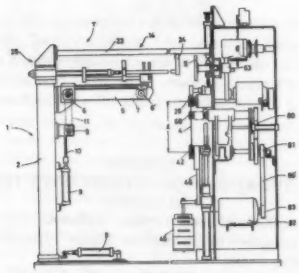
Takashi Tomiyori, Kobe; Misao Fukuda, Hyogo; Iwao Yamashita, Hyogo; Nobuo Simizu, Hyogo, and Takeshi Kumano, Hyogo, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Apr. 15, 1983, Ser. No. 485,458

Claims priority, application Japan, Apr. 17, 1982, 57-64447

Int. Cl.[3] B24B *49/02*; B07C *5/07*

U.S. Cl. 51—165 R 20 Claims



1. Apparatus for sorting power transmission belts having different lengths, said apparatus comprising:

belt drive mechanism including a drive pulley and a driven pulley, means for rotatively driving said drive pulley about a fixed first axis and means for supporting said driven pulley for rotation about a second axis reciprocatively translatable along a guide path toward and from said first axis;

belt supply means for storing a plurality of V-belts;

first transfer means for automatically transferring said belts one at a time to said belt drive mechanism to be entrained about said drive and driven pulleys;

means for causing said belt drive mechanism to drive the belt transferred thereto under a preselected tension;

means for measuring the length of the driven tensioned belt; and

second transfer means for automatically transferring the measured belts from the belt drive mechanism to any one of different collecting stations corresponding one each to different preselected ranges of belt lengths, thereby sorting the belts into a plurality of groups of belts each having a different preselected range of lengths when utilized as power transmission belts.

3. The belt sorting apparatus of claim 1 further including grinding means for modifying the cross-sectional configuration of the belts while being driven under tension by said belt drive mechanism to adjust the effective length thereof when the measuring means measures a driven, tensioned belt having an effective length which is shorter than the shortest of the preselected range.

4,505,074

GRINDING MACHINE CONTROL SYSTEM FOR INTERMITTENTLY MEASURING WORKPIECE SIZE

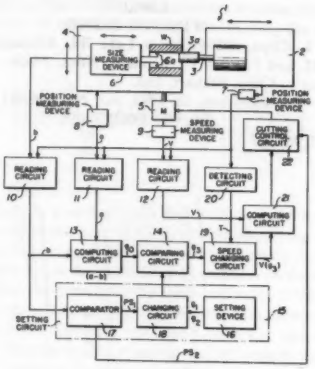
Toshiharu Kogure, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Chiba, Japan

Filed May 17, 1982, Ser. No. 379,153

Claims priority, application Japan, May 21, 1981, 56-76909

Int. Cl.[3] B24B *49/04*

U.S. Cl. 51—165.77 6 Claims



1. A control system for a grinding machine of the type having a movable cutting table for holding a workpiece and which is movable in an infeed direction along a first axis, and a movable grinding stone table carrying thereon a grinding stone and which is reciprocably movable along a second axis at a certain period of reciprocation to effect grinding of the workpiece by the grinding stone, the control system comprising: variable speed drive means for infeeding the cutting table in the infeed direction along the first axis at a variably settable infeeding speed; speed detecting means for periodically detecting the infeeding speed of the cutting table at a periodicity synchronized with the period of reciprocation of the grinding stone table and producing a corresponding speed signal; workpiece size detecting means for periodically detecting the size of the workpiece being grinded by the grinding stone at a periodicity synchronized with the period of reciprocation of the grinding stone table and comparing the detected size with a reference value and producing a resultant error signal indicative of the difference between the detected size and the reference value; and computing means responsive to the speed signal and the error signal for periodically computing a speed correction signal at a periodicity synchronized with the period of reciprocation of the grinding stone table and applying the same to the variable speed drive means to accordingly control the infeeding speed of the cutting table.

4,505,075

FIXTURING DEVICE

Stuart C. Salmon, and Larry D. Zeltner, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed May 16, 1983, Ser. No. 495,278

Int. Cl.[3] B24B *49/10*

U.S. Cl. 51—165.75 5 Claims

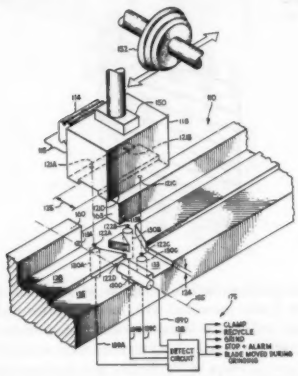
1. Apparatus for positioning a workpiece supported by a casting having a plurality of reference points defined thereon, the casting having a channel, comprising:

(a) a plurality of sensing means, each for producing a signal in response to the crossing of the trigger point of the sensing means by one of the reference points, and each sensing means having hysteresis;

(b) hysteresis reduction means for removing the hysteresis at predetermined points in time; and

(c) control means

(i) coupled to the sensing means for receiving the trigger signals,



(ii) coupled to the hysteresis reduction means for receiving information as to the predetermined time intervals, and

(iii) for activating a clamping means in response to the signals of (i) and information of (ii) for clamping the casting to the apparatus.

4,505,076

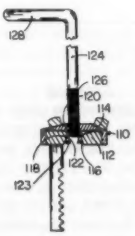
MEANS FOR DRIVINGLY ATTACHING A REPLACEABLE STONE ASSEMBLY TO A MASTER STONE HOLDER

Robert M. Sunnen, Frontenac, Mo., assignor to Sunnen Products Company, St. Louis, Mo.

Continuation of Ser. No. 314,856, Oct. 26, 1981, abandoned. This application Oct. 26, 1983, Ser. No. 545,120

Int. Cl.³ B24B *33/00*

U.S. Cl. 51—206.5 **32 Claims**



1. Mounting means for honing stones and the like comprising a support structure including a plate member having opposite surfaces and spaced openings located extending therethrough, a stone assembly for mounting on the plate member including a backing member formed of a material that is relatively malleable, said backing member having opposed surfaces one of which is adapted to be placed in surface-to-surface contact with one of the opposed surfaces of the plate member, a honing stone mounted on the other opposed surface of the backing member, at least two spaced tubular members formed integrally on said one opposed surface of the backing member at locations to simultaneously register with and to be insertable into the respective spaced openings in the plate member, said tubular members each having an opening extending therethrough which openings also extend through the backing member thereat, the surface contour of the outer surfaces of the spaced tubular members closely conforming to the surface contour of at least a portion of the respective spaced openings in the plate member so that the tubular members can be simultaneously inserted into the respective spaced openings in the plate member while in substantially surface-to-surface contact therewith, and a threaded member having a threaded portion for threading through the openings in each respective tubular member starting from either end thereof when the tubular members are positioned extending into respective ones of the spaced plate openings whereby the threaded portion of the threaded member permanently plastically deforms said tubular members as it forms threads therein and simultaneously expands the tubular members outwardly in the respective openings to make a permanent tight engagement with the plate member to connect the backing member to the plate member, said permanent tight engagement with the plate openings remaining even if the threaded member is removed.

4,505,077

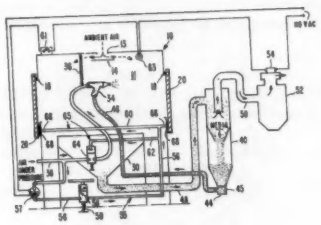
CABINET DOOR INTERLOCK

Gary Sheesley, and Michael Grudzinski, both of Bensalem, Pa., assignors to Empire Abrasive Equipment Corporation, Langhorne, Pa.

Filed Mar. 16, 1983, Ser. No. 475,820

Int. Cl.³ B24C *7/00, 3/04*

U.S. Cl. 51—415 **12 Claims**



1. In a blast-finish cabinet in which the surfaces of articles may be blast-finished by abrasive media carried in a stream of air supplied from a source of air under pressure, the cabinet having a blast chamber provided with at least one opening providing access to the interior of the chamber, said opening being normally closed by a latched access door openable by a user to permit said articles to be inserted in and removed from the cabinet interior through said opening, a blast nozzle within the chamber for directing against the article surface abrasive media carried in said stream of air under pressure, and a primary air line through which the carrier air is supplied under pressure directly from said source to the nozzle, an improved interlock system for shutting off the supply of air to the nozzle whenever the door is inadvertently left unlatched and open, comprising:

(a) a normally closed main control valve of the pneumatic, pilot-air-controlled type mounted in the primary line and comprising the sole valve controlling the passage of the carrier air through the primary line;

(b) a pilot air tubing system disposed wholly outside the flow path of the carrier air stream passing through the primary line from said source to the nozzle and including

(1) a pilot air supply line branching off from and connected in communication with the primary line at a location between said source and the valve; and

(2) a pilot air control line in communication with the pilot air supply line and having at least one outlet opening to the ambient atmosphere, the control line having a connection to the main valve effective to operate the valve to open position in the presence of air under pressure within the control line;

(c) means on the door adapted to sealably close the outlet opening of the pilot air control line responsive to closing and latching of the door, the outlet opening exhausting to the ambient atmosphere air flowing into the pilot air tubing system from said source when the door is left open, whereby to de-pressurize the pilot air control line and thus prevent operation of the valve from its normally closed condition; and

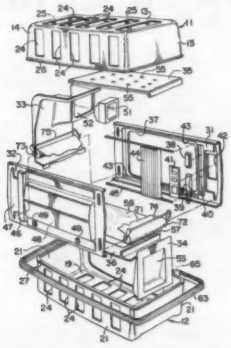
(d) a normally closed secondary valve adapted for operation under the control of an operator and mounted to control flow through the pilot air supply line, said secondary valve being mounted wholly out of the path of the carrier air stream flowing from said source through the primary line to the nozzle.

4,505,078

BEDROOM CABINET

Phil-yool Huh, 5-8, Nakamachi 1-Chome, Musashino-shi, Tokyo, Japan

Filed Oct. 4, 1983, Ser. No. 538,860
Claims priority, application Japan, Oct. 7, 1982, 57-175374
Int. Cl.³ A47G *29/02*
U.S. Cl. 52—36 **20 Claims**



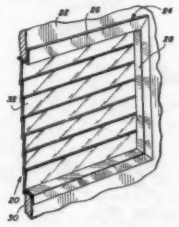
1. A bedroom cabinet for accommodating a prone person and providing an enclosed bedroom for said person, comprising an outer casing in the form of a hexahedron, said outer casing having an upper half and a lower half, said upper casing half having front and rear walls, right and left walls, and a top wall, said lower casing half having front and rear walls, right and left walls and a bottom wall, fastening means joining said upper and lower casing halves to form said hexahedron, said front wall of each of said upper and lower casing halves having opposed notched areas which together form an access opening for said person, an inner casing disposed within said outer casing, said inner casing comprising a front panel, rear panel, right panel and left panel disposed inwardly of said front wall, rear wall, right wall and left wall respectively of said upper and lower inner casing halves, said inner casing further comprising a ceiling panel disposed inwardly and underlying said top wall of said upper casing half and a floor panel disposed inwardly and overlying said bottom wall of said lower casing half, said front panel having an opening aligned with and having substantially the same configuration as said access opening in said outer casing, a mat on said botom panel accommodating said prone person, said inner casing having portions thereof contacting said outer casing such that the overall structural integrity of the bedroom cabinet is increased, said inner casing having portions thereof spaced from said outer casing and providing recesses accessible to said person from the inside of said bedroom cabinet.

4,505,079

THERMAL WINDOW SHIELD

Ervin H. Black, 1415 Wenonah Ave., Berwyn, Ill. 60402

Filed Jun. 10, 1982, Ser. No. 387,044
Int. Cl.³ E06B *1/04*
U.S. Cl. 52—202 **1 Claim**



1. A Thermal window shield adapted to be fitted over a Jalousie window frame provided with metal interior and exterior facing walls defining a window opeining, comprising a thermal frame made from poor heat transmission material, said thermal frame having pairs of vertically and horizontally extending interior and exterior facing walls to substantially and complementarily clad said metal interior and exterior walls, means for heat insulatingly securing each thermal frame to said metal interior and exterior facing walls, a thermal pane made from poor heat transmission material, a pair of deep channel forming members extending downwardly about 50% along the length of said vertically extending exterior facing walls, a further deep channel forming member extending completely across the width of upper horizontally extending exterior facing wall and communicating with said pair of channel forming members, and a shallow channel forming member extending completely across the width of lower horizontally extending exterior facing wall, all of said channel forming members cooperating to receive and removably support said thermal pane, whereby said deep channel forming members cooperate to prevent said thermal pane from bowing in either direction because of temperature differential existing across the thickness of said thermal pane.

4,505,080

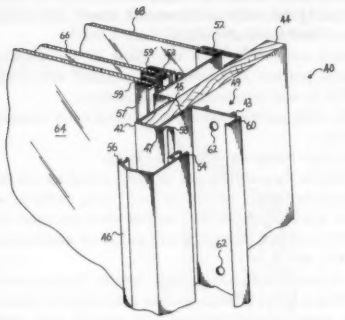
DOOR OR WINDOW FRAME ASSEMBLY

Vernon R. Sailor, 1400 W. Bristol St., Elkhart, Ind. 46514

Continuation of Ser. No. 284,557, Jul. 20, 1981, , which is a continuation-in-part of Ser. No. 171,731, Jul. 24, 1980, Pat. No. 4,330,972. This application Oct. 14, 1983, Ser. No. 542,143
The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.
Int. Cl.³ E06B *1/04*
U.S. Cl. 52—211 **13 Claims**

1. A preconstructed frame assembly adapted for insertion into a door opening defined by an outlining wall structure, said frame assembly comprising an outer frame having spaced margins and including a U-shaped part at one of said frame margins, said U-shaped part terminating in an outturned wall, a wooden inner frame member, one edge of said inner frame member fitting into said outer frame U-shaped part with said outturned wall of the outer frame being located to project outwardly from the inner frame member, said inner frame member extending generally coextensively with said outer frame member between said frame margins, said frame member outturned wall and inner frame member adapted to overlie spaced portions of said wall structure defining said door open-

ing when said frame assembly is inserted into the door opening, said frame member outturned wall constituting means for



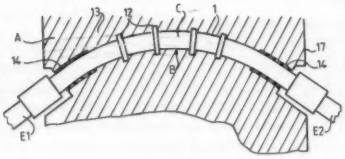
receiving fasteners anchored into said wall structure at said opening.

4,505,081

CURVED DEVICE FOR CONNECTION BETWEEN TWO RECTILINEAR PORTIONS OF A STRETCHED CABLE

Antonio Dinis, Noisy le Roi; Carlos de la Fuente, Nanterre, and Paul Mondorf, Ville D'Avray, all of France, assignors to Freyssinet International (STUP), Boulogne-Billancourt, France

Filed Aug. 18, 1982, Ser. No. 409,287
Claims priority, application France, Aug. 21, 1981, 81 16079
Int. Cl.³ E04C *3/10*
U.S. Cl. 52—223 L **10 Claims**



1. Apparatus for connection between two rectilinear portions of a stretched cable, said apparatus being adapted to pass through a massive constructive work and to transmit tension from one of said portions of stretched cable to the other, said apparatus comprising said two rectilinear portions of a stretched cable, a segment of cable disposed between and interconnecting said two rectilinear cable portions, said segment of cable including a prestressed outer tubular envelope containing a plurality of cable strands, said outer tubular envelope being filled, at least partly, with a hardened cementitious material, said strands being separated from one another and stretched with a total tension force at least equal to that of the more stretched of said two portions of cable, said strands being anchored to the ends of said outer tubular envelope for ensuring precompression of said outer tubular envelope.

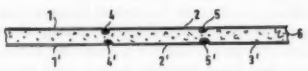
4,505,082

STRUCTURAL PANEL

Peter Schmitz, Bahnhofstrasse 3, D-4401 Altenberge, Fed. Rep. of Germany

Filed Feb. 10, 1982, Ser. No. 347,373
Int. Cl.³ E04C *2/26*
U.S. Cl. 52—309.8 **14 Claims**

1. A platelike structural panel comprising a first continuously formed sheet and a second continuously formed sheet spaced from said first sheet with a core of foamed material therebetween joined to the surfaces of said sheets adjacent the foamed material so as to strengthen said panel, each said sheet comprising at least a pair of longitudinally extending sheet metal plates, each of said plates having a longitudinal edge extending adjacent the longitudinal edge of the next adjacent plate, each of the lonitudinal adjacent edges being folded to define a pair of continuously formed strips at the longitudinal adjacent edges, said pair of strips together defining a total of at least three continuously bent strip portions, said three strip portions being positioned in overlying, directly contacting relationship with each other and continuously joining and locking said adjacent plates together along their said longitudinal edges to form a grooved seam, said seam defining a shallow crease between the surfaces of adjacent plates of said first and second sheets opposite said foamed material whereby said adjacent plate surfaces are contiguous to each other, said overlying, directly contacting strip portions of both said first and second sheets being positioned in the space between said sheets so as to extend into and be embedded in said foamed material in the space, said core of foamed material extending continuously across said overlying locked strip portions and between the plates of said first and second continuously formed sheets, and said first and second continuously formed sheets and said core are cut transversely of said seam to define said panel.

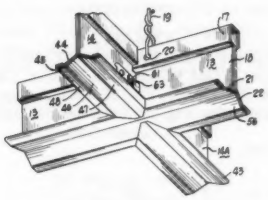


4,505,083

DELINEATED CEILING GRID IN SUSPENDED CEILING

David F. Mieyal, Strongsville, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Filed Mar. 29, 1982, Ser. No. 362,615
Int. Cl.³ E04B *5/52*
U.S. Cl. 52—476 **9 Claims**



1. A suspension ceiling comprising, in combination:

a rectangular grid structure and a plurality of rectangular ceiling panels, said grid structure including a plurality of spaced-apart substantially parallel first runners and a plurality of spaced-apart substantially parallel second runners extending substantially perpendicular to said first runners, said first and second runners cooperating to form grid openings for receiving said rectangular ceiling panels;

said runners being connected together by joints located at each corner of each rectangular opening, said joints providing a through runner extending through said joint and a pair of opposed runners terminating adjacent to the associated through runner, each opposed runner providing connecting means connecting the end thereof to said through runner, said connecting means being structured to prevent any substantial movement of the ends of said opposed runners toward each other beyond their normal connected position,

said runners having an inverted generally T-shaped structure with a stiffening spine longitudinally disposed thereon, web means depending from said spine and first

and second outwardly extending flanges connected to the lower portions of said web means by first and second connector portions, respectively, said first and second flanges lying generally in a common plane perpendicular to said web means and said first and second connector portions being displaced out of plane of said flanges in a direction toward said web means to establish a longitudinal recess along each T-shaped structure exposed to view from below the ceiling grid, a junction line between each flange and the respective connector portions, each said ceiling panel having a length and width dimension substantially equal to the dimensions between opposite junction lines within a given rectangular grid opening whereby if a ceiling panel is not properly centered in the grid opening so that the horizontal bottom surface of said ceiling panel rests on the flanges but instead one edge of the panel rests on a connector portion, the vertical spacing between the panel bottom surface and the respective flanges is observable from below the ceiling, said connector portions also operating to maintain a panel in its proper centered position;

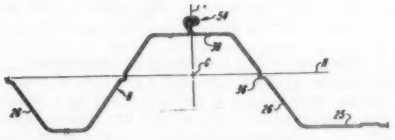
said connecting means by preventing longitudinal movement of adjacent ends of said opposed runners at said joints preventing said opposed runners from causing the adjacent flanges of said through runners to be displaced toward each other by any material amount, the flanges and a portion of said connector portions of said through runners providing notches at about 45° at said joints, and the ends of said flanges and at least a portion of said connecting portion at the ends of said opposed runners being shaped to mate with associated notches and provide a miter joint along both said flanges and said longitudinal recess, said notches terminating at an inner end spaced along said connector portions from said flanges whereby a portion of said connector portions extends past said notches to provide stiffness to said through runners through said joints, said portions of said connector portions extending past said notches being sufficiently small so that they do not materially detract from the appearance of said miter joints.

4,505,084

WIDE PANEL, PANEL ASSEMBLY

Gary A. Knudson, 17356 W. 57th Ave., Golden, Colo. 80401

Division of Ser. No. 236,832, Feb. 23, 1981, Pat. No. 4,364,253.
This application Aug. 30, 1982, Ser. No. 412,580
Int. Cl.³ E04D 1/00
U.S. Cl. 52—528 **23 Claims**



1. In a balanced wide panel roll-formed into a particular configuration from a substantially flat sheet of metal stock material, the combination comprising:

(1) a substantially flat, lower, intermediate wall portion which:

(a) forms a bottom wall that is normally disposed in a substantially horizontal plane and

(b) has a longitudinally extending groove;

(2) a pair of upwardly diverging inclined sidewall portions,

(a) said sidewall portions extending laterally out from the lateral extremities of said intermediate wall portion,

(b) said sidewall portions being turned upwardly from the plane of said intermediate wall portion at a bend through a selected acute angle greater than 45°,

(c) each sidewall portion having a longitudinally extending groove;

(3) a substantially flat upper wing portion

(a) extending laterally out from the lateral extremity of each of said sidewall portions and

(b) turned outwardly from the plane of the associated sidewall portion at a bend to a position substantially parallel to said intermediate wall portion,

(c) each wing portion having a longitudinally extending groove;

(4) a male edge fastening means including:

(a) an outwardly inclined side section extending out from a lateral extremity of one of said wing portions and turned upwardly from the plane of the associated wing portion at a bend through a selected acute angle greater than 45°, and

(b) an inwardly extending male lateral flange portion including a lateral flange section extending in from the upper edge of said inclined side section and turned inwardly from the plane of said inclined side section through a bend of about 125° and looped back at an inside bend along a terminal flange section to provide a double flange thickness arranged substantially parallel to and spaced substantially above the associated wing portion, said outwardly inclined side section being of a length sufficient to raise said inwardly extending lateral flange portion beyond the associated supporting wing portion to permit a seaming roller to engage said inwardly extending lateral flange portion and have operating clearance in relation to the associated supporting wing portion as well as providing increased seam strength, said outwardly inclined side section locating said inwardly extending lateral flange portion in a substantially centered position in relation to the lateral extremity of the associated supporting wing portion; and

(5) a female edge fastening means including:

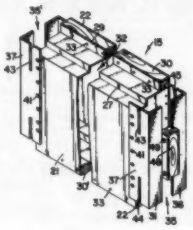
(a) an inwardly inclined side section extending in from a lateral extremity of the other of said wing portions and turned upwardly from the plane of the associated wing portion at a bend through an acute angle greater than 45° to be positioned above the associated wing portion, and

(b) a female lateral flange portion including an outwardly extending, substantially flat, lateral flange section extending out from said inclined side section and turned out from the plane of said inwardly inclined side section through a bend of about 115°–120° to which there is connected an inclined downwardly extending terminal flange section extending back in relation to said side section for only a minor portion of the length of said side section to provide an inverted open flat-bottomed channel having sides inclined to the bottom, said inverted channel having a size and shape to form a receiving opening sized to receive the male edge fastening means of an adjacent similar panel in a nesting relationship without the rotation of said similar panel, said inclined side section being of a length sufficient to raise said channel beyond the associated supporting lateral extremity edge portion to permit a seaming roller to engage said inwardly inclined side section and have operating clearance in relation to the associated supporting edge portion as well as providing increased seam strength, said inwardly inclined side section locating said outwardly extending lateral flange section in a substantially centered position in relation to the associated supporting edge portion and also providing an overhanging inwardly inclined tracking surface for said seaming roller to engage, track, and be retained thereon during the seaming operation.

4,505,085
SPLIT PANEL ASSEMBLY

Wayne H. Oliver, and Janet L. Oliver, both of 1305 Spring Valley Rd. North, Minneapolis, Minn. 55422

Filed Dec. 3, 1982, Ser. No. 446,682
Int. Cl.³ E04C 1/10
U.S. Cl. 52—582 4 Claims



1. A load-bearing building panel adapted to be secured to a like panel to create a building panel assembly having thermal insulating properties, said panel comprising:

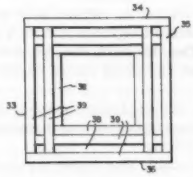
a single-piece construction including a primary face portion having a first free end and a second end, and a connecting portion extending outwardly from said face portion second end, said connecting portion having a first end formed integral with said face portion and a second free end lying in a plane substantially parallel to said face portion, said panel being secured to a second panel of identical construction to form a thermally insulated building panel assembly in the following manner, each of said respective face portion first free ends being secured to said other panel respective connecting portion second end with thermal insulating spacers being positioned between said secured panel portions; and

means on at least one of said secured panel portions for interlocking said panel assembly to a second panel assembyl of like construction, said interlocking means including a connector having two slotted members and means for thermally insulating said connector members from each other.

4,505,086
WOOD JOINT CUTTER AND METHOD THEREFOR

Frede O. Hansen, 770 W. 19th Ave., Vancouver, B. C., Canada V5Z 1X2

Continuation-in-part of Ser. No. 378,982, May 17, 1982, abandoned. This application Dec. 6, 1983, Ser. No. 558,452
Int. Cl.³ B27M 1/00
U.S. Cl. 52—593 16 Claims



1. A method of preparing a construction material joint component through use of a rotary tool, comprising the steps of:

(a) securing a shank to said tool whereby said shank rotates on an axis when said tool is operated;

(b) providing said tool with a guide;

(c) securing a first cutting base to said shank adjacent said guide whereby said first base is rotatable with said shank and said first base has a plurality of peripherally disposed cutting teeth;

(d) mounting at least a first spacer to said shank adjacent said first base;

(e) securing a second cutting base to said shank adjacent said at least a first spacer whereby said second base is rotatable with said shank and said second base has a plurality of peripherally disposed cutting teeth;

(f) connecting a depth guide to said tool;

(g) providing a construction material;

(h) operating said tool and thereby rotating said cutting bases;

(i) engaging a peripheral surface of said material with said guide and feeding said material into cutting engagement with said teeth;

(k) maintaining said construction material peripheral surface against said guide;

(l) removing a portion of the peripheral surface in contact with said guide and thereby forming an outer groove and while forming said outer groove simultaneously forming an inner groove spaced from said outer groove by a tongue and forming said tongue by maintaining said first cutting base inner surface a fixed distance from said second cutting base outer surface and cutting said second groove inner surface parallel to said first groove inner surface and forming said tongue in said material to have a cross sectional configuration substantially equal to the cross sectional configuration of said second groove so that at least the width of the top of said tongue substantially equals the width of the bottom of said second groove and width of the base of said tongue substantially equals the width of the tope of said second groove;

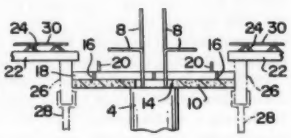
(m) continuing to feed said material until the peripheral surface engages said depth guide and thereby finishes cutting said grooves; and,

(n) removing said finished work piece from engagement with said guide.

4,505,087
METHOD OF CONSTRUCTION OF CONCRETE DECKS WITH HAUNCHED SUPPORTING BEAMS

Nandy M. Sarda, Clearwater, Fla., assignor to U.S. Filigree Wideslab, Inc., Tampa, Fla.

Filed Mar. 14, 1983, Ser. No. 475,185
Int. Cl.³ E04G 21/00
U.S. Cl. 52—741 6 Claims



1. A method of construction of concrete decks with haunched supporting beams and formed of precast concrete members supported upon reinforced concrete columns with concrete poured thereover, comprising the steps of constructing a plurality of rows of reinforced concrete columns of predetermined height;

supporting by shoring a precast concrete capital panel positioned above and transverse to the axis of each of said columns, said panel having predetermined thickness and transverse dimensions with a portion of the downward face of said panel being adjacent and facing the uppermost extremity of said column, and said panel having an aperture therethrough exposing at least a portion of said column uppermost extremity;

supporting by shoring and placing between each adjacent pair of said column and capital panel combinations in each

row elongated precast concrete beam means, with a predetermined portion of the longitudinally outermost extremities of said beam means horizontally overlapping with a downwardly facing portion thereof vertically proximal to a portion of the transverse extremities of the upper face of the respective said capital panels;

supporting by shoring and placing between each adjacent pair of rows of said beam means a plurality of elongated precast concrete slabs with a predetermined amount of the longitudinally outermost extremities of each said slab horizontally and vertically proximal to but supported above a portion of one of the transverse extremities of the respective said beam means; and

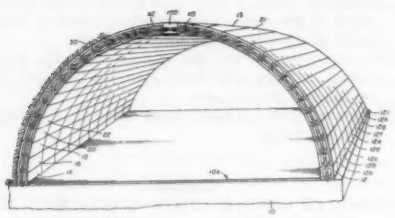
pouring concrete over the entire combination of columns, capital panels, beam means and slabs to a predetermined vertical height, whereby the entire combination is cast into a monolithic structure with the beam means and the capital panels forming beams haunched adjacent the columns.

4,505,088

METHOD OF CONSTRUCTING ARCUATE STRUCTURES

Lloyd K. Lippe, P.O. Box 95, Seguin, Tex. 78155

Filed Jun. 24, 1982, Ser. No. 391,566
Int. Cl.³ E04B *1/32;* **E04G** *21/20*
U.S. Cl. 52—747 **3 Claims**



1. A method of constructing arcuate structures, comprising the steps of

(a) pouring a planar concrete slab (10);

(b) positioning two spaced parallel longitudinal rows of modified concrete construction blocks on said slab, the blocks of each of said rows being arranged in contiguous relation and containing longitudinal slots (53) in the opposite sides thereof, respectively, said slots of the blocks of each row being in alignment to define a pair of longitudinal slots extending continuously along each row of blocks;

(c) positioning an elongated shear fastening member (51) in the continuous slot of each row of blocks said shear member having a width greater than the depth of said slot, whereby said shear member protrudes laterally from said slot;

(d) alternately positioning subsequent rows (16, 18 20, 22) of said blocks and said elongated shear fastening members on said two rows of blocks, the continuous longitudinal aligned slots of adjacent rows of blocks being arranged opposite each other and having one of said elongated shear fastening members arranged therein, said subsequent rows and fastening members forming a pair of arcuate locked walls extending toward each other with an opening therebetween at the highest point from said concrete slab without the continuous use of a supporting structure during the formation thereof;

(e) arranging an adjustable concrete pour form having at least one longitudinal steel reinforcing member in said opening;

(f) laterally adjusting said pour form to completely fill said opening; and

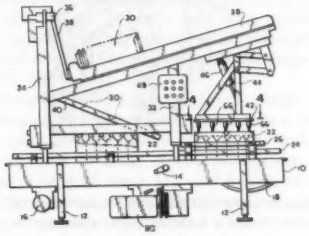
(g) filling said pour form with poured concrete, thereby to define a rigid keystone (100).

4,505,089

CARRIER APPLICATOR

John F. Osteen, Lynchburg, Va., assignor to DACAM Corporation, Madison Heights, Va.

Filed Mar. 11, 1982, Ser. No. 357,255
Int. Cl.³ B65B *27/04, 21/00*
U.S. Cl. 53—48 **16 Claims**



1. Apparatus for applying a carrier to a set of containers, the carrier being of the type having a substantially planar first surface with spaced container engaging openings therein, a plurality of second surface sections, located at a level spaced from the first surface and an at least partially inclined side surface extending between the first surface and each of the second surface sections, said apparatus comprising a platen, means for supporting a set of containers with a carrier situated thereon and means for moving said platen towards said support means, said platen comprising a first set of fingers extending from said platen in the direction of said support means, said fingers of said first set being effective, if said platen and the carrier are not properly aligned, to cooperate with the side surface of the carrier, as said platen moves towards said support means to move the carrier to a position wherein each of said fingers in said first set aligns with and contacts a different one of the second surface sections, said platen further comprising a second set of fingers, said fingers in said second set being adapted to align with and contact said first surface at different points thereon remote from the container engaging openings, said fingers in said first and said second sets each exerting a force, in the direction of said support means, on the respective surfaces with which same are aligned, to cause the containers to be received within the respective container engaging openings, as the platen moves towards said support means.

4,505,090

METHOD AND APPARATUS FOR WRAPPING PAPER ROLLS

John DeLigt, and Willem A. Nikkel, both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

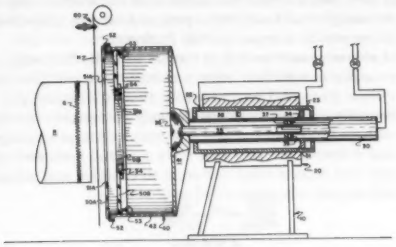
Filed Dec. 18, 1978, Ser. No. 970,221
Int. Cl.³ B65B *49/08, 61/00*
U.S. Cl. 53—137 **2 Claims**

1. An apparatus for applying sheets of header wrapping material over circular ends of various diameter cylindrical mill reels of paper comprising:

A. Axially reciprocable ring frame means of greater inside radius than the largest circular radius of said cylindrical mill reels having a pair of axially adjacent, counterrotatable ring elements; and,

B. Circumferentially resilient aperture means comprising a plurality of resilient, straight line tensile elements stretched across respective chords of a circular opening within said ring elements, opposite distal ends of said straight line elements being secured to respective ones of said counterrotatable ring elements whereby an axially

central iris opening formed by said straight line elements constitutes a freely suspended aperture within said ring



frame means of less inside radius than the smallest circular radius of said reels.

4,505,091

PACKING MACHINE CONTROL

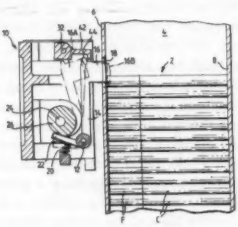
Dennis Hinchcliffe, and Anthony P. Wright, both of London, England, assignors to Molins PLC, London, England

Filed May 10, 1982, Ser. No. 376,447

Claims priority, application United Kingdom, May 20, 1981, 8115455; Jul. 13, 1981, 8121570

Int. Cl.³ B65B *57/16*

U.S. Cl. 53—444 **7 Claims**



1. A method for controlling the operation of a machine for feeding rod-like articles, such as cigarettes, in which said articles are fed intermittently along a channel in juxtaposed relationship and in which said machine continues operation and said articles continue to be fed intermittently for a period of time during decleration of said machine after stoppage of said machine is initiated, comprising the steps of:

(a) detecting any absence of said articles in said channel each time said articles are at rest in said channel between intermittent feeding thereof,

(b) emitting a fault signal upon each detection of the absence of at least one article in said channel,

(c) initiating the stoppage of said machine upon receipt of a fault signal whereby said machine is caused to decelerate, and

(d) automatically restarting said machine if in a subsequent detecting step during said deceleration of said machine no further fault signal is emitted and received for a predetermined period of time during deceleration of said machine.

4,505,092

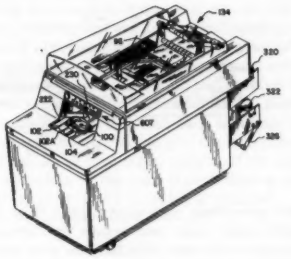
PACKAGE SENSING/FILM CONTROL SYSTEM FOR FILM WRAPPING MACHINE

Russell E. Bowers, Trotwood, and Fritz F. Trieber, Centerville, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Apr. 26, 1982, Ser. No. 371,707

Int. Cl.³ G01G *23/38*

U.S. Cl. 53—504 **18 Claims**



1. In a film wrapping machine including at least a wide roll and a narrow roll of continuous stretchable film, gripper means for drawing a section of one of said rolls of film into said machine, means for selectively presenting any one of said rolls of film to said gripper means, and means for controlling the stroke of said gripper means to determine the length of said section of film drawn into said machine, an improved package sensing and film control system comprising:

lateral sensing means for generating a wide package signal and a narrow package signal representative of the width of a package entering said machine;

longitudinal sensing means for generating signals representative of the length of a package entering said machine;

vertical sensing means for generating a low package signal and a high package signal representative of the height of a package entering said machine; and

control means responsive to said length signals, said width signals and said height signals for controlling said presenting means and said gripper controlling means to select both the width and length of the section of stretchable film drawn into said machine said control means interpreting said length signals as being one of a plurality of package lengths and responding to said package size signals to present the narrow film roll to said gripper means unless a wide package signal or a high package signal is received, in which case the wide film roll is presented and for controlling said gripper controlling means to draw the length of film indicated by said length sensing means with the next longer film length being drawn if a high package signal is received unless the maximum or minimum film length was initially indicated.

4,505,093

APPARATUS FOR COLLATING ARTICLES TO BE WRAPPED INTO BATCHES

Reginald F. Johnson, Lea, near Gainsborough, England, assignor to Baker Perkins Holdings PLC, Peterborough, England

Filed Apr. 14, 1982, Ser. No. 368,351

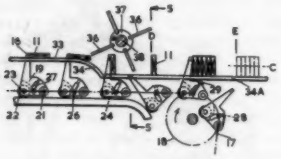
Claims priority, application United Kingdom, May 14, 1981, 8114733

Int. Cl.³ B65B *35/44*

U.S. Cl. 53—531 **5 Claims**

1. A packaging machine, comprising a primary wrapper for applying wrappers to individual sweets or like articles, a support having an initial substantially horizontal flat portion, a descending portion and a further substantially horizontal flat portion, means for feeding the wrapped articles in succession from a discharge point of the primary wrapper onto the support to form on the initial portion thereof a regularly spaced

procession of articles in which the articles lie flat, a series of pushers which are disposed beyond said feeding means and are engageable, each with one of the articles, means for moving the pushers to advance the articles along the support from its initial to its further portion, the pushers normally moving clear of their respective articles after they have reached the further portion of the support to leave said articles resting in a stationary position, means associated with every n^{th} pusher of the



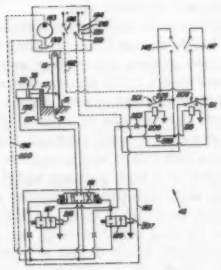
series for preventing each such pusher from disengaging its associated article until said article has advanced, shunting other articles in advance of it, to form with said other articles a batch of contacting articles on the further portion of the support, an overwrapper constituted by a batch wrapping wheel and means for transferring said batches of articles laterally and in succession from the support to the batch wrapping wheel.

4,505,094

ROW CROP HARVESTER GUIDANCE SYSTEM CONTROL CIRCUIT

Donald W. Demorest, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 6, 1983, Ser. No. 529,429
Int. Cl.³ A01D *75/28*
U.S. Cl. 56—10.2 **2 Claims**



1. In a guidance system for a towed row crop harvester, said harvester comprising a crop receiving passageway, a base unit and a tongue pivotally mounted to said base unit, said system comprising:

a hydraulic cylinder connected between said tongue and chassis;

a valve for actuating said cylinder to pivot said tongue and base unit relative to each other and having a valve actuating solenoid;

first and second sensing units mounted on opposite sides respectively of said passageway;

first and second sensor switches actuable respectively by said first and second sensing units; the improvement comprising:

a first relay including a first normally closed relay switch and a first relay coil, said first relay switch connected in circuit between said solenoid and said first sensor switch;

a second relay including a second normally closed relay switch and a second relay coil, said second relay switch connected in circuit between said solenoid and said second sensor switch;

said first sensor switch in circuit with the second relay coil to energize said coil and open said second relay switch when said first sensor switch is closed;

said second sensor switch in circuit with the first relay coil to energize said first relay coil and open said first relay switch when said second sensor switch is closed; and

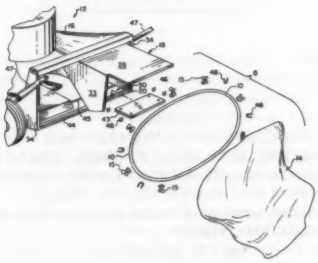
a manually actuable switch selectively connectible in circuit with said solenoid and said first relay coil so as to energize said solenoid and said first relay coil and with said solenoid and second relay coil so as to energize said solenoid and second relay coil.

4,505,095

HOOP ADAPTER ASSEMBLY FOR POWERED LAWN MOWER

Henry A. Short, Sr., 556 E. 88th St., Chicago, Ill. 60619

Filed Mar. 10, 1983, Ser. No. 474,052
Int. Cl.³ A01D *35/22*
U.S. Cl. 56—202 **7 Claims**



1. In a rotary power lawn mower of the type having a discharge duct with an outlet opening for discharge of an air stream carrying leaves, the improvement comprising a hoop adapted assembly for mounting a disposable, commercially available, plastic trash bag about the outlet opening, said hoop adapter assembly including a metal wire hoop adapter in the shape of an oval which is attached to the lawnmower around the outlet opening thereof with portions extending beyond the edges of the outlet opening, means including twist tie wires, for detachably attaching said metal wire hoop adapter to the lawnmower, and clamping means comprising a plurality of pinch clamps for detachably clamping the mouth of the bag to said hoop adapter whereby air can be vented from the disposable trash bag secured on said hoop adapter and whereby the bottom portion of said hoop adapter and the commercially available, disposable, plastic trash bag secured thereto can act as a scoop for scooping up leaves.

4,505,096

SWEEPING MACHINE WITH ARCUATE PADDLE OF FLEXIBLE MATERIAL

Phil Brown, 4689 - 8 Mile Rd., N.W., Conklin, Mich. 49403

Filed Sep. 30, 1982, Ser. No. 431,703
Int. Cl.³ A01D *51/00*
U.S. Cl. 56—328 R **3 Claims**

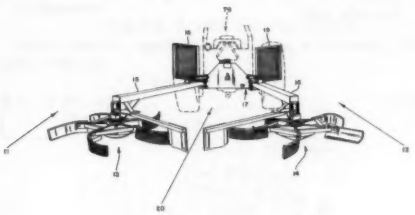
1. A sweeping machine including vehicle means and at least one rotary sweeping device mounted on said vehicle means for rotation on a substantially vertical axis, wherein the improvement comprises:

a boom mounted on said vehicle means for limited pivotal articulation about a vertical axis,

said sweeping device including a central frame structure rotatably mounted for rotation on a substantially vertical axis at the outer extremity of said boom, and also includ-

ing at least one upstanding arcuate paddle of flexible material extending outwardly from said central frame structure, with the convex side thereof disposed on the leading side with respect to the direction of rotation, and with the bottom edge of said convex side being free of structure attached thereto so that said convex side is positioned to engage the ground during normal sweeping operation therewith;

ground-engageable support means mounted on one of said



central frame structure and said boom for supporting the outer portion of said boom, together with said rotary sweeping device; and

a normally fixed deflector member mounted on said boom, and including a plate extending substantially radially outward from the rotational path of movement of the outer extremity of said paddle, said plate being disposed to deflect material from said paddle and deposit the same in a row as said vehicle means moves forward; and

drive means for said rotary sweeping device.

4,505,097

METHOD OF SPLICING SPUN YARNS

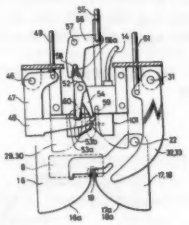
Hiroshi Mima, Joyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 9, 1983, Ser. No. 559,409

Claims priority, application Japan, Dec. 16, 1982, 57-221527

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—22 **6 Claims**



1. A method of splicing spun yarns, wherein the method comprises steps of; introducing a yarn on a package side and a yarn on a bobbin side into a pair of yarn cutting and holding devices and a yarn splicing member disposed between the yarn cutting and holding devices; cutting the ends of each yarns; sucking each end of the yarns into yarn untwisting nozzle pipes, respectively; positioning the untwisted ends of yarns in overlapping relationship within the yarn splicing hole; and acting upon them a compressed fluid to effect an intended splicing of yarns, characterized in that at the same time or just before the end of the yarn on the package side and the end of another yarn on the bobbin side in yarn cutting positions, the yarn ends are grasped, and after cutting of the yarns, both yarns are relaxed whereafter the yarn ends thus cut off are released from the grasped condition to allow the yarn ends to be sucked into the yarn untwisting nozzle pipes.

3. A yarn splicing apparatus for practising the method according to claim 1 or 2, wherein it includes:

a yarn splicing member having a yarn splicing hole to which a compressed fluid injection nozzle is opened;

yarn cutting and holding devices which are disposed at a bobbin side and a package side of the splicing member, respectively and comprises two upper and lower fixed plates and a movable plate disposed to move into a gap between the fixed plates; and

a yarn handling lever which is disposed on one side of the yarn splicing member and the cutting and holding devices and includes a pivot and levers pivotally mounted on the pivot and extending in parallel relation above and below the splicing member and the cutting and holding devices, the timing of such operation of said movable plate being associated with operation of said yarn handling lever by means of cams so that the holding of the movable plate is released at a point of time when tension of the yarn after cutting and holding of the yarn is decreased as the yarn handling lever is retreated to its initial position.

4,505,098

YARN SPLICING APPARATUS FOR SPUN YARNS

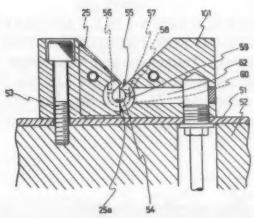
Susumu Baba, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 28, 1984, Ser. No. 594,465

Claims priority, application Japan, Mar. 29, 1983, 58/54830

Int. Cl.³ D01H *15/00*; D02J *1/08*

U.S. Cl. 57—22 **8 Claims**



1. A yarn splicing apparatus for spun yarns characterized in that first and second fluid injection nozzles for producing two whirling flows in the directions opposite to each other are provided at two circumferential positions of a yarn splicing hole, and a third fluid injection nozzle for producing a non-whirling flow is provided midway between said first and second nozzles.

4,505,099

YARN CUTTING DEVICE IN TWISTER

Mitsuo Fukunaga, Kyoto, and Isao Nagao, Shiga, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 26, 1983, Ser. No. 535,740

Claims priority, application Japan, Sep. 28, 1982, 57-147488[U]

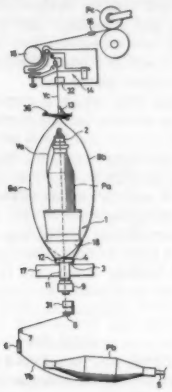
Int. Cl.³ D01H *13/14, 7/86*

U.S. Cl. 57—86 **7 Claims**

1. A yarn cutting device in a two for one twister, the twister being adapted to draw out a first yarn component from a package of a first yarn component installed in a twisting frame while drawing out a second yarn component from a package of a second yarn component disposed below the twisting frame via the hollow spindle of the twisting frame and through a guide hole made in a yarn storage table for arranging and twisting together the drawn out first and second yarn components and for winding these yarns, the yarn cutting device comprising:

a yarn breakage detecting device for detecting a change in the tension on said twisted yarn,

a first cutter which is operated by the detecting device and cuts the second yarn component at a position on the yarn feeding side with regard to the twisting frame, and



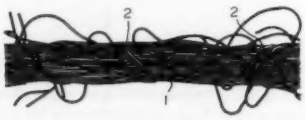
a second cutter which is operated by the detecting device and cuts the first yarn component at a position on the yarn winding side with regard to the twisting frame.

4,505,100

HEAT-DURABLE SPUN-LIKE FASCIATED YARN AND METHOD FOR PRODUCING THE SAME

Sasaki Yoshiyuki, Takatsuki, and Matsumoto Mitsuo, Ibaragi, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 21, 1983, Ser. No. 487,199
Int. Cl.³ D02G *3/02, 3/34, 3/22*
U.S. Cl. 57—207 **2 Claims**



1. A fasciated yarn consisting of staple fibers of a wholly aromatic polyamide polymer prepared by the stretch-breaking of a tow, comprising a core portion and a plurality of wrap fiber groups wrapped around said core portion, said yarn being characterized in that said staple fiber has a mean fiber length within the range of from 150 mm to 600 mm, a crimpability of less than 5%, and a mean degree of parallelism ($\overline{\theta}$) of less than 3°, and that the number of said wrap fiber groups is within the range of from 0.5 to 20 per 1 cm in length of said yarn.

4,505,101

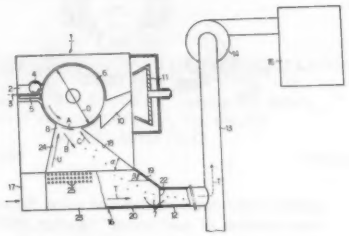
APPARATUS FOR REMOVING TRASH IN AN OPEN-END SPINNING FRAME

Tadanori Kurushima, Kariya; Hideo Hidaka, Aichi, and Hiroyoshi Sonoda, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 12, 1983, Ser. No. 560,451
Claims priority, application Japan, Dec. 17, 1982, 57-222424
Int. Cl.³ D01H *7/888*
U.S. Cl. 57—301 **4 Claims**

1. An apparatus for removing trash in a spinning unit of an open-end spinning frame having a combing roller rotatably disposed in a space formed in said spinning unit for separating a sliver into individual fibers, said space being formed with an opening past which part of the circumferential surface of the combing roller may be exposed for discharging impurities contained in the sliver through said opening into a trash discharging area which is directly communicated with said opening, and a spinning rotor rotatable on an axis at a high speed for collecting fibers therein, said apparatus comprising:

a trash transporting chamber disposed in communication with said opening and including a first side wall facing opposedly toward said opening, an air inlet opening on one end thereof, an air exit opening on the other end thereof, a top wall, and a second side wall provided adjacently to said air outlet opening on opposite side to said first side wall;



said trash transporting chamber being so constructed that its interior may be kept substantially under an atmospheric pressure;

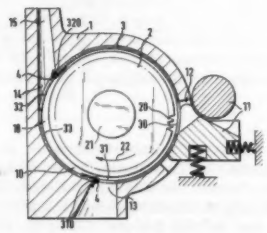
said first side wall being spaced from part of the circumferential surface of the combing roller exposed through said opening at a distance whose value falls within a range from a measurement which is substantially equal to a diameter of said combing roller to a measurement which is substantially equal to two times said diameter.

4,505,102

PROTECTOR DEVICE FOR AN OPEN-END SPINNING APPARATUS

Hans Landwehrkamp, Lenting; Gottfried Schneider, and Johann Pohn, both of Ingolstadt, all of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Aug. 16, 1983, Ser. No. 523,717
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1982, 3230620
Int. Cl.³ D01H *7/895, 7/888*
U.S. Cl. 57—408 **5 Claims**



1. An open-end spinning apparatus having a housing, a fixed end wall for said housing supporting an opening roller, and openable cover provided on said housing, a thin-walled insert carried in an interior space of said housing encompassing said opening roller, openings provided in said insert which correspond to housing orifices which connect the interior space of said housing to other parts of the spinning apparatus, an edge of said insert downstream relative to the fiber flow which bounds the opening for discharging material out of the interior

space partly masking said housing opening, the improvement comprising:

an edge protector slidable onto and engaging said edge of said insert.

4,505,103

CHAIN JOINT FOR LINK CHAINS

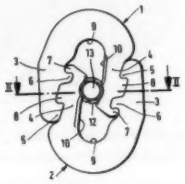
Hans H. Dalferth, Aalen-Wasseralfingen, and Johannes Bauer, Essingen, both of Fed. Rep. of Germany, assignors to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co., Aalen, Fed. Rep. of Germany

Filed Feb. 9, 1983, Ser. No. 465,328

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3207629

Int. Cl.³ F16G *13/06*

U.S. Cl. 59—85 **23 Claims**



1. Chain joint for link chains, having two identical, substantially U-shaped joint halves which are releasably connected to one another and each have an inner leg and an outer leg with mutually facing sides, the mutually facing sides of the inner and outer legs being connected to one another in a closed locked position by at least two in each case and at most four pairs of holding teeth in each case, and a supporting element for the joint halves being arranged between the mutually facing sides of the inner legs, characterised in that, said holding teeth including a plurality of teeth on each of the outer and inner legs (3,4), said teeth being of at least two different thicknesses as measured in a longitudinal direction relative to said chain joint, said thicker teeth on said inner leg being arranged so as to be more closely located proximate to the center of the chain joint than the less thick teeth on said inner leg, and said thicker teeth on said inner leg cooperating with thicker teeth on said outer leg, such that the proportion of forces transmitted from said thicker teeth on the inner leg to said corresponding thicker teeth on said outer leg is increased while the proportion of forces transmitted through the less thick teeth of said chain joint is decreased.

4,505,104

TURBINE OVERSPEED LIMITER FOR TURBOMACHINES

Roy Simmons, Bristol, England, assignor to Rolls-Royce Limited, London, England

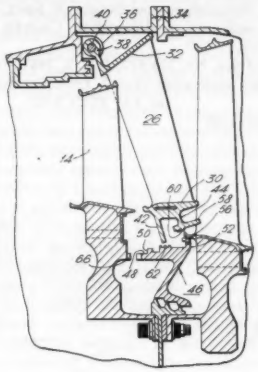
Filed Oct. 6, 1983, Ser. No. 539,380

Claims priority, application United Kingdom, Oct. 6, 1982, 8228583

Int. Cl.³ F02G *3/00*; F01B *25/16*; F01D *21/00*

U.S. Cl. 60—39.091 **9 Claims**

1. A mechanism for preventing a turbine rotor of an engine exceeding a predetermined speed in the event that a shaft connecting the turbine rotor to a compressor rotor of the engine breaks and releases its torsional and axial constraint on the turbine rotor, the mechanism comprising a segmented nozzle guide vane stator assembly downstream of a stage of the turbine rotor, said rotor having blades, each of the segments being pivotally mounted on an outer casing at a region adjacent a radially outer upstream end of each segment, and static structure of the engine on which the radially innermost ends of the segments are mounted, the structure including a releasable means which when the structure is struck by the turbine rotor is operable to release the innermost ends of the segments and allow them to swing rearwards and outwards about the pivotal attachment of the segments to the outer casing whilst retaining



the upstream outer ends of the segments in the path of rotation of the blades of the turbine rotor so that they collide with the blades and decelerate the turbine rotor.

4,505,105

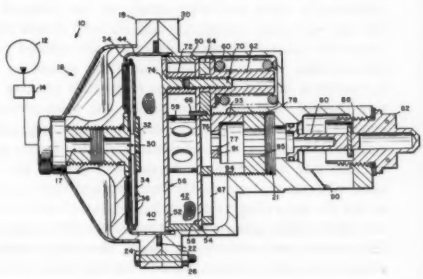
NO-BACK GAS GENERATOR AND METHOD

Ronald J. Ness, Corona, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Aug. 17, 1983, Ser. No. 524,049

Int. Cl.³ F02K *9/42, 9/94*

U.S. Cl. 60—200.1 **17 Claims**



1. A gas generator comprising:

a housing having an inlet adapted to receive pressurized liquid fluid flow and an outlet for discharging a motive gas flow;

a porous bed of granular catalyst material disposed within said housing for reacting with the liquid fluid flow to generate the motive gas flow;

wall means in said housing for containing said bed within a confined space;

spring means operably engaging said wall means for exerting a biasing force in one direction tending to compact said bed of granular material; and

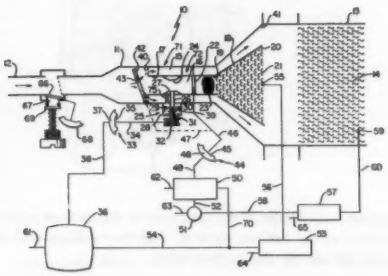
locking means operably engaging said wall means for preventing movement of said bed in a second direction opposite said first direction.

4,505,106

EXHAUST SYSTEM FOR AN INTERNAL COMBUSTION ENGINE, BURN-OFF UNIT AND METHODS THEREFOR

Alfred A. Frankenberg, and Douglas R. Scott, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 326,527, Dec. 2, 1981, Pat. No. 4,449,362.
This application Mar. 7, 1984, Ser. No. 587,201
Int. Cl.³ F01N 3/02
U.S. Cl. 60—286 7 Claims



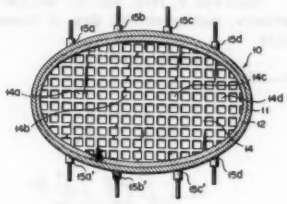
1. In a torch means for a burn-off means for an exhaust system of an internal combustion engine which burns a hydrocarbon fuel mixture and which produces a carbonaceous particle carrying exhaust gas stream that passes through a filter means of said system that retains at least part of said particles therein, said burn-off means being adapted for periodically burning said retained particles in said filter means to tend to periodically clean said filter means of said retained particles thereof, said torch means for said burn-off means comprising means for raising the temperature of said exhaust gas stream intermediate said engine and said filter means to raise the temperature of said filter means to particle burning temperature thereof, said means for raising the temperature of said exhaust gas stream comprising means for injecting and burning a certain amount of said fuel mixture in said exhaust gas stream intermediate said engine and said filter means, the improvement wherein said means for injecting and burning comprises means for aspirating said certain amount of said fuel mixture into said exhaust gas stream intermediate said engine and said filter means and said means raising the temperature of said exhaust gas stream comprises an electrical heater means and a catalyst bed in which said injected fuel mixture is to burn, said electrical heater means and said means for aspirating said fuel mixture being disposed upstream from said catalyst bed with said heater means being disposed intermediate said means for aspirating said fuel mixture and said catalyst bed, said means for raising the temperature of said exhaust gas stream also comprising passage defining means having an inlet for receiving said exhaust gas stream from said engine and an outlet for directing said received exhaust gas stream to said filter means, said catalyst bed and said heater means being disposed in said passage defining means, said means for aspirating said fuel mixture being disposed to feed said fuel mixture to said passage defining means upstream of said heater means therein, said passage defining means having valve means disposed in said passage defining means between said means for aspirating said fuel mixture and said heater means for closing said passage defining means between said inlet and said outlet.

4,505,107

EXHAUST GAS CLEANING APPARATUS

Shunzo Yamaguchi, Okazaki; Takeshi Fukazawa, Kariya, and Morihiro Atsumi, Toyohashi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 25, 1982, Ser. No. 436,439
Claims priority, application Japan, Oct. 26, 1981, 56-171021; Oct. 26, 1981, 56-171022
Int. Cl.³ F01N 3/02
U.S. Cl. 60—303 14 Claims



1. An apparatus for cleaning exhaust gas discharged from a Diesel engine to the outside through an exhaust passage, comprising:

a hollow casing having a prescribed cross-sectional shape and opening at both ends, the inside space of the casing forming part of the exhaust passage;

a filter packed in the casing to catch particulates in the exhaust gas when the exhaust gas is passed through the filter;

ceramic heating resistors disposed in the casing on the upstream side of the filter with respect to the flow of the exhaust gas, and having passages through which the exhaust gas can pass, the ceramic heating resistors corresponding to a plurality of divided parts of the cross section of the inside space of the casing;

pairs of electrodes provided for the individual ceramic heating resistors, through which the corresponding ceramic heating resistors are energized; and

energizing means connected to the electrodes for successively applying electric current between the individual pairs of electrodes to heat the ceramic heating resistors one after another, so that the heated ceramic heating resistors burn the particulates collected around the same.

4,505,108

INTEGRATED HYDRAULIC CONTROL CIRCUIT FOR JET ENGINE THRUST REVERSER AND VARIABLE EXHAUST NOZZLE

Frank Woodruff, New Hartford; John H. Ferguson, Jr., Sauquoit, and John R. Hoffman, New Hartford, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 180,273, Aug. 22, 1980, Pat. No. 4,383,647.
This application Aug. 25, 1982, Ser. No. 411,166
Int. Cl.³ F15B 13/02, 15/18, 15/26
U.S. Cl. 60—327 15 Claims

1. A hydraulic circuit for moving a movable member, the movable member including at least one double acting hydraulic actuator responsive to first and second actuator fluids to move the movable member between a first and second position respectively, and a mechanically actuated locking mechanism responsive to a mechanical motion for locking the movable member in said first position, said hydraulic circuit comprising:

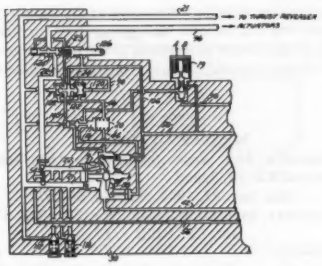
a housing defining a chamber containing case fluid at a first pressure;

fluid pump means for increasing the pressure of said case fluid to supply servo fluid at a servo pressure;

servo valve means for modulating said servo fluid to produce hydraulic position signals in response to received first and second commands;

piston pump means for alternatively supplying first and second actuator fluids in response to said hydraulic position signals;

sequencing valve means for modulating said servo fluid in response to said piston pump means supplying said first and said second actuator fluids to produce hydraulic lock and unlock signals, said sequencing valve means having a first state generating said unlock signal in response to the pressure of said first actuator fluid exceeding a first predetermined value and switchable to a second state producing said unlock signal in response to the pressure of said second actuator fluid exceeding a second predetermined value; and



lock pin actuator means for controlling the output of said first actuator fluid and for producing a first mechanical motion in a predetermined sequence in response to said hydraulic lock signal, and for producing a second mechanical motion in a direction opposite said first mechanical motion in response to said unlock signal.

4,505,109

HYDRAULIC CONTROL APPARATUS PARTICULARLY STEERING APPARATUS

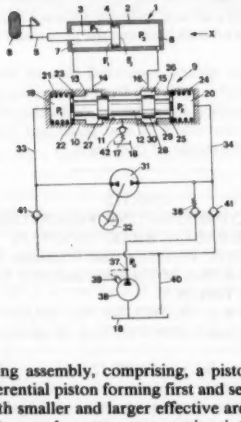
Svend E. Thomsen, Nordborg, and Erik Kyster, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg

Continuation of Ser. No. 204,303, Nov. 5, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 415,485

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1979, 2946247

Int. Cl.³ F16D *31/02*

U.S. Cl. 60—386 **4 Claims**



1. A steering assembly, comprising, a piston cylinder unit having a differential piston forming first and second expansible chambers with smaller and larger effective areas, respectively and first and second port means opening into said first and second chambers respectively, a control valve having a housing and spool valve with first and second spaced apart collars slidably disposed in said housing and forming a central valve chamber and first and second valve chambers at opposite ends of said control valve housing for respectively receiving pressurized fluid to regulate the position of said spool valve, spring means for biasing said spool valve towards a neutral position, said housing having a first and a second port having fluid communication with said piston cylinder unit first and second port means, respectively, said first valve chamber having constant and unobstructed fluid communication with said control valve housing first port, said second collar forming dual throttling means relative to said control valve housing second port when said spool valve is in a neutral position and in an operative turning position to provide oppositely acting throttling between said control valve housing second port and said central and second valve chambers, said control valve housing having exhaust port means for the egress of fluid in said central valve chamber, supply pump means for supplying pressurized fluid to said first and second valve chambers, and manually operable pump means for selectively and incrementally increasing and decreasing the pressures of said first and second valve chambers in a pushpull mode to effect movement of said piston in either direction.

4,505,110

HYDROSTATIC STEERING SYSTEM

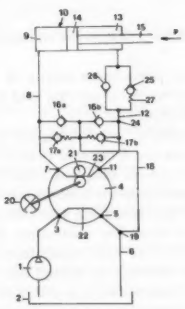
Ulf M. von Huth Smith, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Aug. 4, 1982, Ser. No. 405,192

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1981, 3131619; Aug. 31, 1981, 3134341

Int. Cl.³ B62D *5/08*; F15B *13/042*

U.S. Cl. 60—384 **4 Claims**



1. A hydraulic steering control system comprising, a bidirectional differential type servomotor having a piston with a rod extending from only one side thereof and rod side and non-rod side operating ports on opposite sides thereof, pump and tank means, manually operable steering control means, a metering control unit having a housing, metering motor means in said housing controlled by said steering control means, said housing having a supply port connected to said pump means and an exhaust port connected to said tank means, said control unit being of the reaction type and having a neutral position wherein pressure fluid is bypassed from said pump means to said tank means, said housing having first and second control ports, means connecting said control ports respectively to said rod and non-rod side servomotor operating ports, first and second check valve means having output sides respectively connected to and being openable towards said servomotor operating ports and having input sides connected to and in open communication with said housing exhaust port and tank means, flow path means corresponding to a neutral position of said steering control means, said flow path means providing a reaction mode by connecting said servomotor ports to each

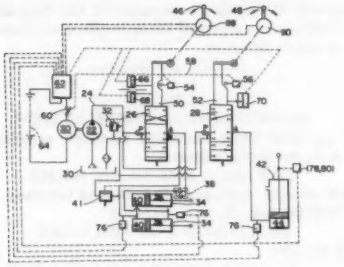
other via said housing control ports and said metering motor means, antiparallel check valve means in said flow path means including two check valves, one of said check valves including loading means to allow opening thereof at a predetermined pressure on the order of 3 bar in the same direction as a pressure at said housing exhaust port would otherwise tend to move said piston towards said servomotor rod side port.

4,505,111

HYDRAULIC CONTROL SYSTEM FOR INDUSTRIAL VEHICLE

Masaya Okamoto, and Shigeru Terada, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 19, 1982, Ser. No. 399,339
Claims priority, application Japan, Jul. 29, 1981, 56-117825
Int. Cl.³ F16D *31/00*
U.S. Cl. 60—431 **3 Claims**



1. A hydraulic control system for an industrial vehicle or the like comprising:

a hydraulic pump providing a supply of hydraulic fluid;

a variable speed motor for driving said pump;

a source of motive power;

a first control valve for controlling the supply of hydraulic fluid under pressure from said pump to a first hydraulic servo cylinder means, said first control valve being connected with said pump for continuously receiving hydraulic fluid under pressure from said pump;

a second control valve for controlling the supply of fluid under pressure from said pump to a second hydraulic servo cylinder means, said second control valve being in constant fluid communication with said pump for receiving the hydraulic fluid under pressure from said pump;

a first switch responsive to said first valve opening by a predetermined small amount;

a second switch responsive to said second valve opening by said predetermined small amount;

a motor energization switch responsive to said first and second switches for connecting said motor with said source of motive power upon either of said first and second valves being opened to said predetermined small amount;

a first pressure/voltage transducer for sensing the load applied to said first hydraulic servo cylinder means;

a second pressure/voltage transducer for sensing the load applied to said second hydraulic servo cylinder means;

a first variable rheostat operatively connected with said first valve for sensing the degree by which said valve is opened;

a second variable rheostat connected with said second valve for sensing the degree by which said second valve is opened;

a control circuit operatively connected with and responsive to said first and second variable rheostats and said first and second pressure/voltage transducers for controlling the speed of said motor;

first and second manually operable members operatively connected with said first and second valves, respectively; and

first and second tachogenerators mechanically connected with said first and second manually operable members, respectively;

said first and second tachogenerators outputting signals indicative of the rate at which said first and second valves are opened;

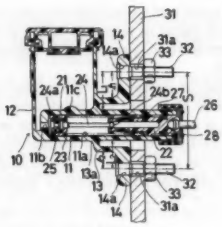
said control circuit being responsive to the signals outputted by said first and second tachogenerators for varying the speed of said motor in response to the rate of movement of said first and second manually operable members.

4,505,112

MASTER CYLINDER

Kaoru Nakamura, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 23, 1983, Ser. No. 554,677
Claims priority, application Japan, Nov. 30, 1982, 57-210170
Int. Cl.³ F15B *7/10*
U.S. Cl. 60—533 **6 Claims**



1. A master cylinder of resin material adapted to be connected to a dashboard and operatively associated with a pedal, comprising:

a cylinder;

a piston sealingly slidable in response to a depressing force on said pedal;

a cylindrical portion having an inner diameter which is larger than that of an outer periphery of said cylinder and coaxially rearwardly extending radially outwardly of said cylinder and a connecting portion connected with said outer periphery of said cylinder forward of the forwardmost point of contact between the piston and the cylinder; and

mounting flange means connected to said dashboard and unitarily radially extending from the rearward end of said cylindrical portion for reducing deflection of said flange means upon movement of said pedal and restricting any increase in idle stroke of said pedal.

4,505,113

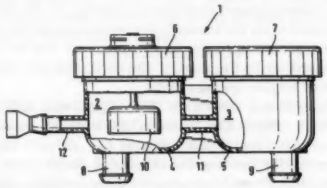
PLASTIC COMPENSATING RESERVOIR FOR HYDRAULIC BRAKE SYSTEMS

Hans-Dieter Reinartz, Frankfurt, and Waldemar Vatter, Laubach, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Aug. 29, 1983, Ser. No. 527,018
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1982, 3239438
Int. Cl.³ B60T *17/22*
U.S. Cl. 60—535 **6 Claims**

1. A plastic compensating reservoir for hydraulic brake systems, such as for brake systems of automotive vehicles, said reservoir including two interconnected brake fluid storage

chambers each of which is in communication with a respective port adapted to be connected to a pressure chamber of a tandem master brake cylinder, the invention in which said reservoir comprises a generally cylindrical housing containing said chambers in an annular band, and in which there is a float chamber within said reservoir concentric to the axis of the housing inside of said band with a generally cylindrical wall of lesser height than the housing height defining said float chamber, radial walls extending from the float chamber wall to combinedly form with said float chamber wall said storage



chambers, a port extending from each storage chamber, passages from said float chamber extending to the respective storage chambers to place that chamber and said storage chambers in communication, a downwardly projecting outlet port extending from each storage chamber to the exterior thereof, a generally horizontal tube extending generally transverse to the axis of the housing adjacent the bottom of said housing, the tube having an opening within the reservoir in one storage chamber, and the outlet port from said one storage chamber projecting from said tube.

4,505,114

POWER BOOSTER

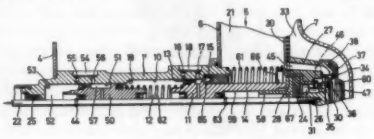
Lucas H. Haar, Niddatal, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 238,869, Feb. 27, 1981, abandoned. This application Jul. 21, 1983, Ser. No. 515,731

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013456

Int. Cl.³ B60T *13/20*

U.S. Cl. 60—554 **18 Claims**



1. A power booster for a hydraulic brake system of an automotive vehicle comprising:

a booster having a booster housing fastened to one end of a housing of a master cylinder, a working piston movable within said booster housing and sub-dividing said booster housing into a low-pressure chamber and a working chamber, a valve device carried by said working piston to control the pressure in said working chamber, and a reaction device which, upon actuation of said booster adds up the force of an actuating rod connected to a control element of said valve device to the force delivered by said working piston in a predetermined ratio and transmits the resultant force to a hollow push rod actuating said master cylinder;

said actuating rod extending coaxially through said push rod and said master cylinder housing to enable actuation of said control element from the other end of said master cylinder housing;

the other end of said master cylinder housing being secured to a mounting member of said vehicle; wherein

one end of said push rod is guided in said master cylinder housing adjacent said one end thereof and the other end of said push rod supports said working piston thereon; wherein

said push rod is integrally formed with a piston of said master cylinder and is disposed coaxially of a longitudinal axis of said master cylinder housing; and wherein

said push rod carries a pressure plate on the end thereof adjacent said working piston, said pressure plate abutting said reaction device, guiding said working piston and having a cylindrical projection thereon engaging a bore in said push rod.

4,505,115

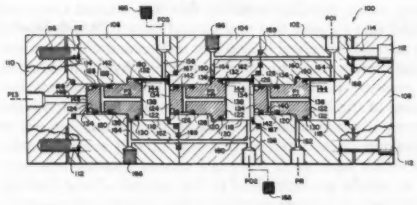
FLUIDIC TRANSFORMER APPARATUS WITH FEEDBACK

Donald P. Arbuckle, 4483 S. Vrain, Denver, Colo. 80236

Filed Sep. 8, 1981, Ser. No. 299,868

Int. Cl.³ B60T *11/20*

U.S. Cl. 60—562 **26 Claims**



1. A fluidic transformer operative with respect to a reference pressure for transforming an input pressure into at least one output pressure, comprising:

means defining a plurality of pistons;

means operatively retaining each piston for reciprocative movement in a reference movement path associated with each piston;

each piston defining a large surface and two small surfaces, the two small surfaces oriented to each derive force from pressure applied thereto to each move each piston in one direction in its reference movement path, the large surface oriented to derive force from pressure applied thereto to move each piston in the opposite direction in its reference movement path, each surface presenting an effective area which is defined by that amount of the actual area of the surface which is effective during pressure application to move the piston in its reference movement path, the effective area of the large surface of each piston being greater than the effective area of either of its small surfaces;

means communicating the reference pressure to a surface of one piston;

means communicating the input pressure to a surface of another piston;

internal pressure communication means for directly communicating pressures between different surfaces of different pistons to create at least one internal pressure at at least one surface of at least one piston, the internal pressure defined substantially only by the magnitude of the input pressure relative to the reference pressure and a ratio of the effective areas of the surfaces of the pistons; and

means for communicating the internal pressure as the output pressure.

4,505,116

DUAL-CIRCUIT BRAKE CONTROL ARRANGEMENT

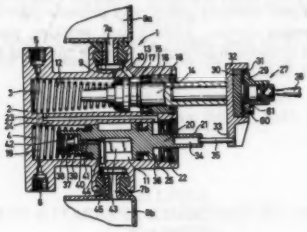
Rolf Weiler, Frankfurt-Sindlingen, and Peter Böhm, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 23, 1981, Ser. No. 314,276

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045814

Int. Cl.³ B60T *11/20*

U.S. Cl. 60—562 25 Claims



1. An arrangement for controlling the pressure of hydraulic braking fluid in two separate braking circuits of a hydraulic braking system, comprising a master cylinder device including housing means defining separate first and second chambers arranged side by side, first and second master pistons respectively movably received in said first and second chambers and defining therein respective first and second hydraulic braking fluid pressure compartments each of which communicates with one of the braking circuits, and means for applying the pressure prevailing in said first pressure compartment to one of said braking circuits and to that side of said second master piston which faces away from said second pressure compartment to supply pressure fluid to the second of said braking circuits from said second pressure compartment; and means for pressurizing the hydraulic braking fluid at least in one of said pressure compartments in direct response to the application of an actuating force, including a pressure element mechanically connected to said first master piston and acted upon by the actuating force, and means for mechanically engaging said pressure element with said second master piston when the extent of movement of said first master piston relative to that of said second master piston exceeds a predetermined limit.

4,505,117

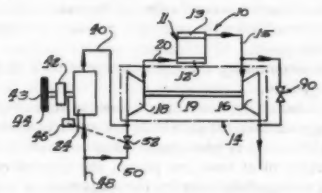
TURBOCHARGED INTERNAL COMBUSTION ENGINE HAVING AN ENGINE DRIVEN POSITIVE DISPLACEMENT COMPRESSOR

Hideaki Matsuoka, Decatur, Ill., assignor to Warner-Ishi, Decatur, Ill.

Filed Jun. 7, 1982, Ser. No. 386,040

Int. Cl.³ F02B *37/04*

U.S. Cl. 60—609 10 Claims



1. The combination comprising:

an internal combustion engine having an air intake to receive a charge of compressed air and an exhaust outlet for discharging exhaust gases,

a turbocharger having a compressor for compressing air and connected to the air intake to supply a compressed air charge thereto,

a turbine in said turbocharger connected to and driven by exhaust gases from the exhaust outlet of the engine and driving the compressor to compress air,

means to control the turbocharger to limit the pressure of the compressed air charge to below a predetermined pressure at high engine speeds,

a positive displacement compressor having an air inlet and an air outlet with the outlet being connected to the inlet of turbocharger compressor to compress air and to supply compressed air to the inlet of the turbocharger compressor at low engine speeds,

direct drive means driven by the engine and selectively operable to drive the positive displacment means and being selectively disabled, and

control means for limiting the combined air pressure being supplied when both compressors are operating to below the predetermined pressure level and to effectively disable the direct drive means and the positive displacement compressor from compressing air when the turbocharger is supplying a compressed air charge at a desired pressure level.

4,505,118

INFRARED RADIATION COOLER FOR PRODUCING PHYSIOLOGIC CONDITIONS SUCH AS COMFORT OR HYPOTHERMIA

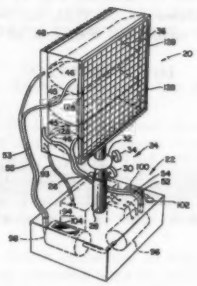
Gerald Altman, 2249 Commonwealth Ave., Newton, Mass. 02166

Continuation of Ser. No. 138,494, Apr. 9, 1980, Pat. No. 4,318,722. This application Mar. 5, 1982, Ser. No. 354,142

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.³ F25B *21/02*

U.S. Cl. 62—3 3 Claims



1. A radiation cooler for localized non-contact cooling of a human subject, comprising:

(a) a forward array of radiation concentrators, a rearward heat sink means, and an array of radiation receiving surface elements therebetween;

(b) said array of radiation concentrators having a forward array of extended apertures and a rearward array of restricted apertures and having inner surfaces that are highly reflective in the mid and far infrared radiation region;

(c) said forward array of extended apertures being operative to receive infrared radiation from said human subject;

(d) said array of radiation receiving surface elements being registered and optically communicating with said rearward array of restricted apertures;

(e) an array of Peltier type thermoelectric elements having

cold junctions conductively connected to said array of receiving surface elements and hot junctions conductively connected to said heat sink means;

(f) said heat sink means including a metallic conductor that has an extensive outer convective surface;

(g) an electrical system for energizing said array of thermoelectric elements such that said cold junctions in operation are at subfreezing temperature;

(h) means for preventing the deposition of frost on said radiation receiving surface elements;

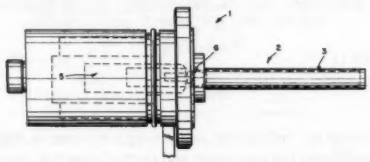
(i) said radiation cooler, with respect to an axis directed forwardly and rearwardly, being greater in lateral extent than in longitudinal extent.

4,505,119

FLEXIBLE LINKAGE FOR THE DISPLACER ASSEMBLY IN CRYOGENIC COOLERS

Nachman Pundak, Ein Herod, Ihud, Israel

Filed Jul. 8, 1983, Ser. No. 512,411
Claims priority, application Israel, Dec. 9, 1982, 67441
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—6 **2 Claims**



1. A split cycle cryogenic cooler comprising an axially elongated displacer having a first end and a second end, an axially extending driving piston driving said displacer, said driving piston being in substantially axial alignment with and spaced axially from said displacer, said driving piston having a first end adjacent and spaced from the second end of said displacer and a second end more remote from the second end of said displacer, a linkage member forming a flexible connection between the first end of said driving piston and the second end of said displacer, said linkage member being in general axial alignment with said displacer and driving piston and having a first end connected into the second end of said displacer and a second end connected to the first end of said driving piston, said second end of said displacer forms an axially extending bore having a circumferential surface and said first end of said linkage member extends into said bore and has a circumferential groove therein in spaced facing relation with the circumferential surface of said bore, and an elastomeric ring seated within said groove and extending radially outwardly into sealing contact with the circumferential surface of said bore and permitting flexible angular and concentric misalignment between said displacer and said driving piston while maintaining said linkage member gas-tight for eliminating any gas bypass around said displacer.

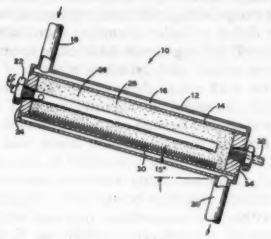
4,505,120

HYDROGEN COMPRESSOR

Peter M. Golben, Wyckoff, N.J., assignor to Ergenics, Inc., Wyckoff, N.J.

Filed Dec. 27, 1982, Ser. No. 453,109
Int. Cl.³ F17C *11/00*
U.S. Cl. 62—48 **9 Claims**

1. A hydrogen compressor, the compressor comprising a cooling jacket, the jacket circumscribing a container, hydridable material disposed within the container, means for heating the compressor disposed within the container, a spring filter disposed within the container for absorbing expansion of the hydridable material disposed within the container, an input/output line for introducing and withdrawing hydrogen into and from the container, the hydridable material suspended in



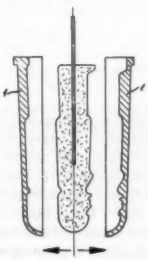
an aluminum foam matrix, and conduit means for introducing and withdrawing coolant into and from the jacket.

4,505,121

METHOD OF FREEZING ARTICLES IN CONTAINERS AND APPARATUS FOR CARRYING OUT THE METHOD

Klaus Gram, Vojens, Denmark, assignor to Brodrene Gram A/S, Vojens, Denmark

Filed Feb. 9, 1984, Ser. No. 578,440
Claims priority, application Denmark, Feb. 11, 1983, 604/83
Int. Cl.³ B65B *63/08*
U.S. Cl. 62—60 **7 Claims**



1. A method of making frozen articles in freezing molds comprising cooling said freezing molds while empty to a temperature below the freezing temperature of a liner fluid, spraying the inner surfaces of said cooled freezing molds with said liner fluid so as to freeze a coating upon said inner surfaces by extracting heat from said liner fluid by said cooled freezing molds, filling said freezing molds with the material to form said frozen articles, cooling said freezing molds to freeze said material and form said frozen articles, heating said freezing molds with the coatings and frozen articles therein sufficiently to melt said coatings, and removing said frozen articles from said freezing molds.

4,505,122

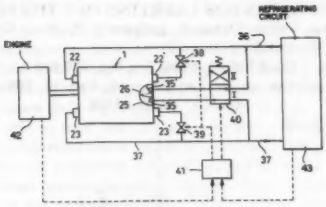
VARIABLE DELIVERY COMPRESSOR

Kenichi Inomata, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1983, Ser. No. 538,199
Claims priority, application Japan, Oct. 8, 1982, 57-177280
Int. Cl.³ F04B *49/00*
U.S. Cl. 62—133 **8 Claims**

1. A compressor comprising: a cylinder block having a first group of cylinders and a second group of cylinders formed therein, said cylinders of each of said first and second groups being circumferentially arranged at equal intervals and extending parallel with each other, corresponding ones of said cylin-

ders of said first and second groups being axially aligned with each other; a plurality of double acting pistons received within said axially aligned corresponding ones of said cylinders, said pistons each cooperating with said corresponding ones of said cylinders to define cylinder chambers therebetween at opposite ends thereof; driving means for causing reciprocal motions of said pistons within said cylinders of each of said first and second groups with equal phase differences; first and second cylinder heads arranged at opposite ends of said cylinder block; first and second suction chambers formed, respectively, within said first and second cylinder heads, said first and second suction chambers being connected to one side of a compression fluid circuit associated with said compressor, said first and second suction chambers being out of communication with each other within said compressor; first and second discharge chambers formed, respectively, within said first and second cylinder heads, said first and second discharge chambers being connected to another side of said compression fluid circuit, said first and second discharge chambers being out of communication with each other within said compressor; a plurality of discharge ports communicating respective ones of said cylinder chambers defined within said cylinders of one of said first



and second groups with a corresponding one of said first and second discharge chambers; a rotary discharge valve arranged within said corresponding one discharge chamber and disposed to close said discharge ports, said discharge valve comprising a fulcrum shaft arranged within said corresponding one discharge chamber, and a valve body rotatably supported by said fulcrum shaft, said valve body having a plurality of closing peripheral portions disposed to overlap with respective ones of said discharge ports; changeover means for selectively causing said discharge valve to assume a first position wherein said discharge valve keeps all said discharge ports closed for normal valving action thereof, and a second position wherein said discharge valve keeps all said discharge ports opened; a stop valve connected between said corresponding one discharge chamber and said another side of said compression fluid circuit, for interrupting the communication therebetween; and control means for controlling said changeover means and said stop valve in synchronism with each other, said control means being operable to cause said discharge valve to assume said second position thereof through said changeover means, and at the same time to cause said stop valve to assume a closed position thereof.

4,505,123

ABSORPTION HEAT PUMP SYSTEM

Hiroyoshi Kusakabe; Hideo Ishiko; Takeshi Okumura; Masashi Izumi, and Masahiro Furukawa, all of Oizumi, Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

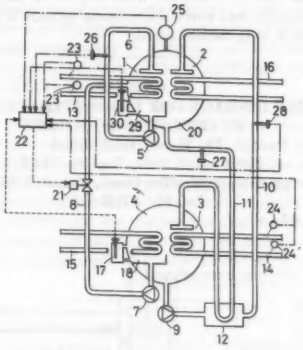
Filed Feb. 4, 1983, Ser. No. 463,837

Int. Cl.³ F25B *15/00*

U.S. Cl. 62—148 **17 Claims**

1. An absorption heat pump system which uses a heating medium to evaporate a refrigerant and supplies heat to a load at a higher temperature than that of the heating medium employed, comprising:

a generator for generating a gaseous refrigerant from an absorption solution, a condenser in functional relationship with the generator for condensing the gaseous refrigerant into liquid form, an evaporator for evaporating the refrigerant, a refrigerant passage connecting the condenser to the evaporator, an absorber in functional relationship with the evaporator for absorbing gaseous refrigerant from the evaporator, a concentrated solution passage connecting the generator to the absorber for passing the absorption solution from the generator to the absorber, a dilute solution passage connecting the absorber to the generator for



passing the refrigerant and absorption solution from the absorber to the generator, and control means in the refrigerant passage for controlling the flow rate of the liquid refrigerant for stabilizing the temperature in the evaporator, said control means being a proportional controller for effecting a proportional control of the flow rate of said refrigerant flowing from said condenser to said evaporator in response to the amount of liquid refrigerant in said condenser.

4,505,124

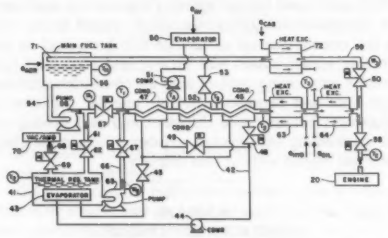
HEAT MANAGEMENT SYSTEM FOR AIRCRAFT

Arnold H. Mayer, Huber Heights, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 22, 1983, Ser. No. 534,996

Int. Cl.³ F25D *17/00*; B64D *37/00*

U.S. Cl. 62—180 **13 Claims**



1. A heat management system for an aircraft having an engine, a main fuel tank for storage and supply of fuel for said engine, a first fuel line through which fuel is supplied from said main fuel tank to said engine for consumption therein, and a main fuel pump for pumping said fuel from said main fuel tank to said engine through said first fuel line, comprising:

a. a cooling loop thermally interfacing the fuel flow through said first fuel line for extracting heat from the fuel contained in said main fuel tank by circulation of a refrigerant through said loop, said loop including a condenser near

said first fuel line intermediate said main fuel pump and said engine, said condenser thermally interfacing the fuel flow through said first fuel line, an evaporator near said main fuel tank and thermally interfacing the fuel contained therein, and a thermal expansion valve and compressor intermediate said condenser and evaporator for circulating said refrigerant through said loop;

b. a second fuel line interconnecting said main fuel tank with said first fuel line at a point intermediate said condenser and said engine, for recirculating to said main fuel tank fuel flowing through said first fuel line in excess of momentaneous engine consumption requirements; and

c. a first control valve for controlling the flow of fuel through said second fuel line.

4,505,125

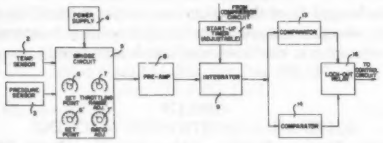
SUPER-HEAT MONITORING AND CONTROL DEVICE FOR AIR CONDITIONING REFRIGERATION SYSTEMS

Richard A. Baglione, 2220 Park Ave., #15, Santa Clara, Calif. 95050

Continuation of Ser. No. 228,590, Jan. 26, 1981, abandoned. This application Jan. 7, 1983, Ser. No. 456,583

Int. Cl.³ F25B *41/00*

U.S. Cl. 62—209 **11 Claims**



1. Apparatus for quantitatively monitoring the amount of super-heat contained in the refrigerant vapor of an air conditioning refrigeration system and locking-out the refrigeration system in response to sustained variation of the super-heat above or below predetermined quantitative limits defining a "deadband" for longer than selected intervals, comprising:

(a) means for independently sensing the temperature and pressure of the refrigerant vapor and reflecting the sensed values of the temperature and pressure as values of electrical resistance;

(b) a power supply adapted to provide a predetermined regulated output;

(c) a bridge circuit connected to said power supply and to said temperature and pressure sensors and responsive to said values of electrical resistance and calibrated to balance said values of electrical resistance to produce a predetermined electrical output signal correlated quantitatively to said super-heat;

(d) a preamplifier connected to receive said predetermined electrical output signal from said bridge circuit;

(e) an integrator circuit connected to receive the output signal of the amplifier and adapted to produce either a positive or negative output when said super-heat varies from said predetermined value;

(f) a pair of comparator circuits connected to receive the output from said integrator circuit and adapted to produce an output signal through one or the other of two output circuits depending upon whether the output from said integrator is positive or negative and of a predetermined value; and

(g) lock-out means responsive to variations in said bridge circuit output above or below said predetermined quantitative limits whereby lock-out timing becomes a function of the amount that said predetermined quantitative limits of super-heat are exceeded.

4,505,126

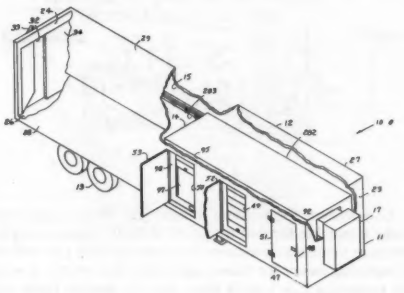
FOOD PRODUCT TRANSPORT SYSTEM

Robert Jones, Sunset Harbor, and Hubert R. Thompson, Belleview, both of Fla., assignors to Certified Grocers of Florida, Inc., Ocala, Fla.

Filed Jun. 6, 1984, Ser. No. 617,717

Int. Cl.³ B60H *3/04*

U.S. Cl. 62—239 **11 Claims**



1. A food product transport system comprising: a land vehicle that includes an elongated van body having a floor with opposite ends that include a front end and a rear end, an upright rear end wall that extends transversely of the van body and is mounted at the rear end of said floor and provided with an entranceway to the interior of the van body, and an upright side wall that extends between said opposite ends, an elongated insulated cargo carrier located in the interior of said van body and being shaped and arranged for withdrawal therefrom through said entranceway thereto, said carrier having opposite end walls that are spaced apart longitudinally of the van body and extend transversely thereof, opposite side walls that are spaced apart transversely of the van body and extend between said opposite end walls of the carrier, a plurality of compartments that extend transversely of the carrier between said opposite walls and are longitudinally spaced apart in the interior of the carrier between said opposite end walls, an upright wall panel located in the space between a pair of said compartments, said panel extending transversely of the carrier and between the opposite side walls thereof, and means for circulating air between said pair of compartments including an electric fan that is mounted on said panel, means mounted on the vehicle at the exterior of said van body for refrigerating food products located in one of said pair of compartments, one of said opposite side walls of said carrier having a pair of doorways that are horizontally spaced apart and communicate with the respective compartments of said pair thereof, each of said doorways being adapted and arranged for the passage of cargo between the interior and exterior of said carrier, said one of said opposite side walls being proximate to the interior side of said upright side wall, said upright side wall having a pair of entranceways to the interior of said van body and which are arranged in horizontal working alignment with the respective doorways in said one of said opposite side walls of said carrier so that access to the respective compartments of said pair thereof may be gained through said upright side wall of said van body.

4,505,127

METHOD AND APPARATUS FOR TREATING NATURAL GAS FROM GAS WELLS FOR SAFE TRANSPORTATION IN PRESSURE VESSELS

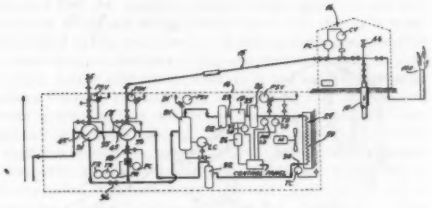
Richard Pronovost, Ste-Julie; Peter Innis, Brossard, and Léo M. O'Rourke, Olds, all of Canada, assignors to SOQUIP, Canada

Filed Feb. 17, 1983, Ser. No. 467,454

Claims priority, application Canada, Apr. 28, 1982, 401826

Int. Cl.³ F25D *23/00*

U.S. Cl. 62—271 **17 Claims**



1. A system for treating natural gas from a gas source to make it suitable for safe transport in high tensile strength steel pressure vessels at pressures in excess of 2000 psi, said system comprising means for taking gas from a gas source, a separator for removing free liquids from gas fed thereto from said gas source to provide a substantially liquid-free gas, a compressor for compressing said substantially liquid-free gas to a higher pressure to reduce the volume of said gas for storage in said pressure vessels, a cooler to further reduce said volume of gas and to recondition the gas for dehydration, a dehydrator to substantially lower the water vapor content in the said gas to a concentration of less than 0.1 lb H_2O/mmscf of gas to prevent the formation of free water within said pressure vessels when transporting and unloading said gas which water could cause internal corrosion and failure of said pressure vessels, loading means to load the pressurized dehydrated gas in said vessels, a heat exchanger connected between said gas source and said compressor to warm up said gas from said gas source to a temperature sufficient to prevent the formation of hydrates for safe operation of a pressure control valve which regulates the gas pressure at an inlet of said compressor to assure constant gas flow through said compressor and said dehydrator having two dessicant towers operating on a two cycle basis whereby one of said towers is regenerated while the other tower is operational, a regeneration gas line at an inlet of each tower, control valve means in said gas line to feed heated regeneration gas from a regeneration gas heater to said regenerating tower during a predetermined time to dry a dessicant in said tower, said regeneration gas heater being implemented with gas from said outlet of said heat exchanger.

4,505,128

COMPRESSOR SYSTEM FOR DISCHARGING DRY AIR

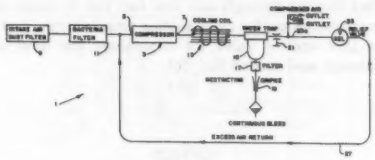
Gregory R. Miller, and Steven G. Clark, both of St. Louis County, Mo., assignors to Bio-Care Incorporated, St. Louis County, Mo.

Filed Aug. 8, 1983, Ser. No. 521,095

Int. Cl.³ F25D *21/00*

U.S. Cl. 62—272 **1 Claim**

1. An air compressor system for discharging a supply of superatmospheric air having a relatively low dew point to health care instruments, said system comprising a compressor having an inlet and an outlet, dust and bacteria filter means coupled to the inlet side of the compressor to remove any impurities from the incoming air, said compressor being an approximately one-half horsepower compressor and elevating atmospheric air to a superatmospheric pressure level of between about 50 to 70 PSIG and at an elevated temperature level, intercooling means receiving said superatmospheric air from said compressor for transferring heat therefrom to the surroundings, water trap means receiving said cooled superatmospheric air from said intercooler means for removing condensed water vapor therefrom, discharge metering orifice means connected with the water trap means for continuously discharging the condensed water vapor without any substantial loss of pressurized air therefrom, restricting orifice means connecting downstream with the water trap means to maintain the superatmospheric pressure of the air upstream thereof at approximately about 65 to 70 PSIG, while maintaining the pressure downstream from said restricting orifice means at



about 50 PSIG, one or more outlets downstream from said restricting orifice means for discharging compressed air having a relatively low dew point and at approximately 50 PSIG to the health care instruments, relief valve means connecting downstream from the outlets for venting said superatmospheric air in the event that it exceeds approximately 50 PSIG, and means for returning excess low dew point compressed air not discharged from the outlets back to the inlet of the compressor whereby said relatively low dew point air is intermixed with atmospheric air drawn into said compressor.

4,505,129

SOLID AIR-CONDITIONING MACHINE

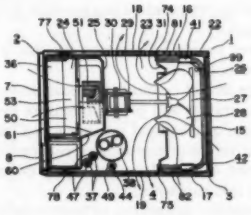
Masataka Yamane, Kusatsu; Akira Kusashio, Ohtsu; Satoru Kudaka, Kusatsu; Tatuhiro Kobayashi, Kusatsu, and Yasuhiko Ebata, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 29, 1983, Ser. No. 490,156

Claims priority, application Japan, Apr. 30, 1982, 57-73601; Sep. 28, 1982, 57-170116

Int. Cl.³ F25B *47/00*

U.S. Cl. 62—280 **11 Claims**



1. A self-contained air-conditioning unit, comprising:

a main body, including an outer box having left and right side walls, top and bottom walls joining said side walls, and a rear face at one end of said side walls, a base plate slidably removably inserted in said outer box, and a bulkhead disposed on said base plate so as to partition the interior of said outer box into an indoor portion and an outdoor portion;

means, including a compressor and a condenser in said outdoor portion, and an evaporator and an indoor fan in said indoor portion, for cooling indoor air, said condenser being located adjacent said rear face and having a central portion and left and right curved ends on opposite sides of said central portion;

an outdoor fan in said outdoor portion directly facing said central portion of said condenser;

a fan motor mounted on said bulkhead and connected to said indoor and outdoor fans for driving said indoor and outdoor fans;

first air inlets having louvers in said left and right side walls, respectively opposite said left and right curved ends at said outdoor portion of said outer box;

blow-off ports in said side walls of said outer box between said outdoor fan and said bulkhead at said outdoor portion of said outer box;

a slinger ring disposed on said outdoor fan so as to scatter condensed water on said base plate, and

second air inlets in said rear face opposing said central portion of said condenser;

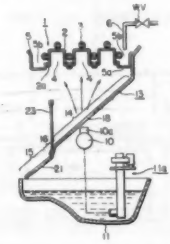
said outdoor fan being located so as to draw air from each of said first and second air inlets respectively through said left and right ends and said central portion of said condenser to said blow-off ports such that some of the condensed water scattered by said slinger ring directly hits said condenser to be evaporated by the air drawn through said first and second air inlets and some of the condensed water scattered by said slinger ring is directly carried by the air drawn through the condenser to said blow-off ports.

4,505,130

ICE MAKING MACHINE

Takashi Hibino; Nobutaka Naruse, both of Toyoake, and Kazuhiro Yoshida, Nagoya, all of Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Mar. 13, 1984, Ser. No. 589,667
Int. Cl.³ F25C *1/12*
U.S. Cl. 62—347 **9 Claims**



1. An ice making machine comprising:

an ice making mold having a plurality of ice making cells in which to form ice cubes and each of which is closed at the top and opened at the bottom;

means mounted below said ice making mold for spraying ice making water into said ice making cells during an ice making operation;

a water tank mounted below said water spray means to store water to be supplied to said water spray means;

an ice stocker mounted in the vicinity of said water tank;

means for separating water and ice cubes from one another, said separating means comprising an inclined plate mounted intermediate said ice making mold and said water spray means with a downward gradient toward said ice stocker, said inclined plate having water spray openings to permit water to be sprayed from said water spray means towards said ice making cells and recovery openings to permit falling water from said ice making mold to be recovered in said water tank; and

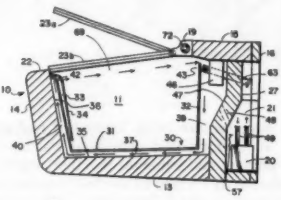
said inclined plate having a corrugated upper section, a corrugated lower section, each said corrugated section comprising an alternate pattern of projections and recesses generally extending in the direction of the water and ice cubes flowing down on the plate, and a transition section positioned between and interconnecting said upper and lower sections, the recesses and projections of said upper section being aligned in said direction with associated projections and recesses of said lower section, said water spray openings being formed in selected ones of said projections of said upper section and said recovery openings being formed in the totality of recesses of said lower section.

4,505,131

INSULATED CABINET

Stanley S. Boxall, P.O. Box 80383, Chamblee, Ga. 30366

Filed Mar. 11, 1983, Ser. No. 474,353
Int. Cl.³ F25D *17/04, 19/02*
U.S. Cl. 62—407 **5 Claims**



1. Refrigerated cabinet apparatus, comprising:

an enclosure defining an insulated region for receiving goods to be cooled;

means within said region defining a goods receiving support spaced apart from the bottom of said enclosure so as to define an air circulation passage therealong between said support and said enclosure;

means associated with said enclosure for defining a cavity separate from said insulated region;

first air flow means communicating between an upper location of said insulated region and an upper portion of said cavity;

second air flow means communicating between a lower portion of said cavity and said air circulation passage;

cooling means in the upper portion of said cavity to cool air therein, so that the cooled air moves downwardly along a path within said cavity and flows through said second air flow means to enter said air circulation passage in said goods receiving region; and

means defining a vertical region of diminishing effective aperture on said path between said upper location and said lower portion of the cavity, so that the relatively dense air cooled by said cooling means moves downwardly through said vertical region of diminishing aperture and thereby moves at an increasing velocity before reaching said lower portion, so as to increase the velocity of cooled air moving by convection to said goods receiving region.

4,505,132

DISPLAY COOLER

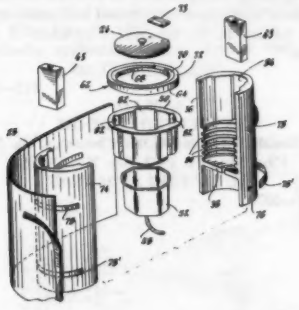
James P. Howes, Fairfield, and James E. Richardson, Weston, both of Conn., assignors to J. P. Howes Productions, Westport, Conn.

Filed Oct. 20, 1983, Ser. No. 543,630
Int. Cl.³ F25D *3/08*
U.S. Cl. 62—457 **9 Claims**

1. A cooler comprising:

a hollow self-supporting low footprint relatively high bin structure formed of an upright insulating material and having a vertically oriented peripheral external wall adapted to receive display material and having a central cavity sized to retain products to be cooled and extending downwardly from the top of the bin structure with the cavity being bounded by a peripheral side wall and a

bottom wall, said peripheral side wall being shaped at an upper part to support ice packs, with a substantial portion of the cavity extending below said upper part of the side



wall, said bin structure being formed of multiple mating segments, which form said peripheral and bottom walls, means for holding said segments together, and liner means placed in the cavity formed by the held together segments.

4,505,133

ABSORPTION REFRIGERATION SYSTEM WITH BOOSTER COMPRESSOR AND EXTRACTION OF A PARTIAL VAPOR FLOW AT AN INTERMEDIATE PRESSURE

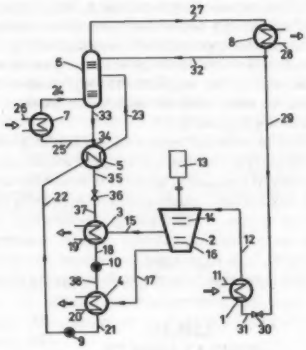
Werner Malewski, and Günther Holldorff, both of Berlin, Fed. Rep. of Germany, assignors to Borsig GmbH, Berlin, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,308

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1982, 3226377

Int. Cl.³ F25B *15/00*

U.S. Cl. 62—476 **3 Claims**



1. A method of operating an absorption refrigeration system with booster compressor means, comprising the steps of: extracting from said compressor at least one partial flow of refrigerant vapor at an intermediate pressure level favorable for the absorption process and injecting said partial flow of refrigerant vapor into at least one additional absorption stage; and compressing only the remaining part of refrigerant vapor to the total final pressure difference, whereby energy required for the compressor is reduced and the energy balance of the absorption refrigeration process is improved due to multi-stage absorption; and comprising further, evaporating refrigerant at evaporation pressure by heat removed from a product to be chilled, suctioning the refrigerant into the booster compressor, compressing the refrigerant vapor in a first compressor stage to said intermediate pressure level, said remaining part of refrigerant vapor being further compressed in a second compressor stage and conveyed to an auxiliary absorber, enriching the absorption solution in two stages with refrigerant vapor, rejecting to ambient means generated absorption heat, conveying the enriched solution to a solution heat exchanger, preheating the enriched solution in said heat exchanger by internal heat exchange with a solution of lower refrigerant concentration and feeding into a lower part of a rectifying column, said solution being regenerated by heat in a desorber connected to said column, generated refrigerant vapor increasing its concentration of refrigerant in said column and entering thereafter a condenser, liquefying the refrigerant vapor in said condenser, expanding the liquefied refrigerant in an expansion valve to evaporation pressure and feeding to an evaporator for closing the refrigerant cycle, a partial flow of liquid refrigerant being fed to the top of said column as reflux, solution with reduced refrigerant concentration leaving said desorber and rectifying column and feeding into said heat exchanger and being expanded after precooling and fed to the first absorption stage to thereby also close the cycle.

4,505,134

FLAT KNITTING MACHINE

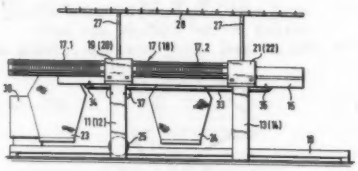
Karl Essig, Gaienhofen, Fed. Rep. of Germany, assignor to H. Stoll GmbH & Co., Reutlingen, Fed. Rep. of Germany

Filed May 9, 1983, Ser. No. 492,701

Claims priority, application Fed. Rep. of Germany, May 27, 1982, 3219860

Int. Cl.³ D04B *7/00, 7/04*

U.S. Cl. 66—60 R **20 Claims**



1. A flat knitting machine, particularly an electronically controlled flat knitting machine, with two needle beds, characterised by the fact that the needle bed or beds (**17, 18**) is or are mounted for movement in the longitudinal direction on the machine frame past at least one stationary knitting assembly (**19–22**) having cam parts for controlling the needles.

4,505,135

SAFETY DEVICE FOR A KNITTING MACHINE

Pierre L. Christinat, Roche, and Louis Frund, Monthey, both of Switzerland, assignors to Atelier de construction Steiger S.A., Vionnaz, Switzerland

Filed Jun. 7, 1983, Ser. No. 501,883

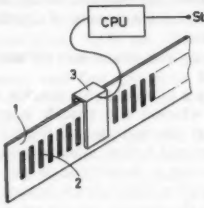
Claims priority, application Switzerland, Jun. 11, 1982, 3634/82

Int. Cl.³ D04B *35/10*

U.S. Cl. 66—157 **7 Claims**

1. A safety device for a flat knitting machine for ensuring that the machine carriage stops in the event of sudden variation in its speed as a result of an impact or other incident, the safety device including means for generating pulses of a length in-

versely proportional to the speed of the carriage, means for continuously measuring the variation in length of the pulses,



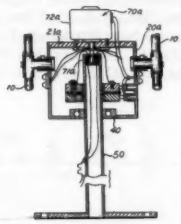
and means for stopping the carriage when this variation exceeds a predetermined reference rate.

4,505,136

DUST BLOWER FOR CIRCULAR KNITTING MACHINES

Jiann T. Tsay, No. 9, Ln. 27, Chung Hsin Rd., Sec. 1, Shi Tzu, Tapei Hsien, Taiwan

Filed Dec. 7, 1982, Ser. No. 447,669
Int. Cl.³ D04B *35/32*
U.S. Cl. 66—168 **1 Claim**



1. A lint blower for circular knitting machines, comprising:
a stand member;
a rotatable frame rotatably mounted onto said stand member, said rotatable frame having an upper plate member;
a plurality of arms each one of which having a first end adjustably mounted onto the periphery of said rotatable frame and a second end extending away from said rotatable frame, said second end having an electric fan adjustably mounted thereon and being adapted to produce an air stream when energized to rotate; and
an electric motor mounted above said upper plate member of said rotatable frame to cause said rotatable frame to rotate independently from the rotation of said electric fans, said electric motor having an output shaft securely connected to an upper end of said stand.

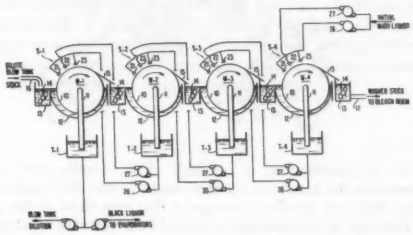
4,505,137

APPARATUS FOR WASHING PAPER PULP

Edward P. Klein, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 447,960, Dec. 8, 1982, Pat. No. 4,491,501. This application Mar. 1, 1984, Ser. No. 585,151
Int. Cl.³ D21C *9/02*
U.S. Cl. 68—62 **3 Claims**

1. An apparatus for washing process liquor from cellulose fiber comprising:
A. a rotary drum screen positioned for chordal section immersion within a vat container of a liquor suspended fiber slurry, a fluid pressure differential being applied across said screen to induce flow of said slurry thereagainst for depositing a mat accumulation of fiber on said screen as said screen rotates through said slurry;
B. a plurality of wash liquor sources disposed above an ascending quadrant of said drum screen where said mat rotatively emerges from a liquid surface level of said vat;
C. first and third sets of said wash liquor sources being disposed relative to an arcuate sequence over said ascending quadrant, such first and third sources having flow discharge diffusion baffles for depositing first and third quantities of wash liquor onto said mat with minimal disturbance of an interstitial matrix of pores and flow channels within said mat; and,



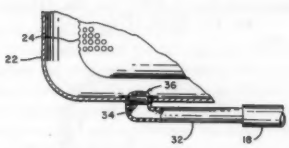
D. a second set of said wash liquor sources being disposed intermediately of said first and third sets relative to said arcuate sequence, such second set sources having flow discharge direction means for directly impinging a second quantity of wash liquor into said mat with maximum pore matrix disturbance but without dislodging said mat from said screen thereby opening previously closed pores and flow channels, said first and third quantities of wash liquor being substantially equal and the second quantity being no more than 20 percent of the sum of the three quantities.

4,505,138

SAVE-A-PUMP

William G. Lang, P.O. 87, West Sayville, N.Y. 11796

Filed Jan. 20, 1984, Ser. No. 572,510
Int. Cl.³ D06F *39/00*
U.S. Cl. 68—208 **2 Claims**

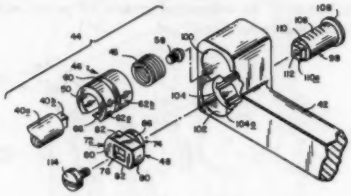


1. In a top loading fabric washing machine having a wash tub, a pump for withdrawing lint and dirt laden water from said tub for discharge, an opening in the bottom of said tub situated where it can be viewed and reached from the top opening into said machine, a drain pump hose connecting said tub opening with the inlet to said pump, a trap mounted through said tub opening into said hose and removeable therewith, said trap comprising a screen consisting of spaced cross members, the spaces between said members in any direction being not less than $\frac{1}{4}$ inch, each of said cross members being curved in cross section so as to minimize turbulence of water flow therethrough, and a threaded body for threaded engagement with said hose, said trap being designed to pass the lint and dirt laden water and minimize the accumulation of such lint and dirt on said cross members.

4,505,139
AUTOMOBILE ROOF PANEL LOCK

William D. Richards, Medway, Mass., assignor to Comfort Auto Industries, Inc., Norwood, Mass.

Filed Nov. 15, 1982, Ser. No. 441,622
Int. Cl.³ E05B 13/10, 55/06
U.S. Cl. 70—221 13 Claims

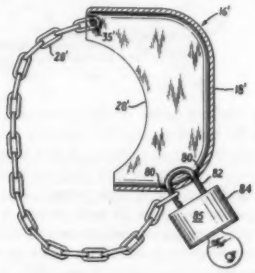


1. In combination, a rotatable shaft, handle and means mounting the handle to the shaft and wherein the handle contains adjacent parallel openings, a first part fixed to the shaft within one of the openings, a second part rotatably mounted to the handle within the other opening, said first part containing an arcuate recess and said second part having diametrically-opposed arcuate shoulders of the radius of curvature of the arcuate recess and diametrically-opposed flat sides at right angles thereto and wherein the parts are positioned within the adjacent openings in the handle for rotation about spaced, parallel axes so that by rotation of the parts relative to each other, one of the arcuate shoulders of the said second part can be positioned in the arcuate recess in the first part, in which position rotation of the handle will rotate the parts in orbit about the axis of the first part and, hence, rotation of the shaft and, alternatively, positioned to dispose one of the flat sides opposite the recess, in which position the handle is disabled and, hence, can be rotated about the axis of the first part without rotating the first part and, hence, without rotating the shaft, and a means comprising a detent in the first part concentric with the recess therein and an annular shoulder on the second part which, by engagement with the detent, prevents the handle from rotating freely in its disabled position.

4,505,140
AUTOMOBILE SECURITY DEVICE FOR STEERING COLUMN IGNITION LOCKS

Joseph E. Solow, Plainview, N.Y., assignor to Wolo Manufacturing Corporation, Deer Park, N.Y.

Continuation-in-part of Ser. No. 236,878, Feb. 23, 1981,. This application Sep. 7, 1982, Ser. No. 415,666
Int. Cl.³ E05B 17/14, 65/12
U.S. Cl. 70—424 3 Claims



1. An automobile security device for protecting a steering column ignition lock comprising:

a cover having a hollow interior space and being open on one side, the open side having arcuate surfaces spacing opposite ends of said cover, thereby being adapted to fit over a portion of a steering column containing an ignition lock;

a flexible tension bearing element having means to receive the free leg of a shackle element of a padlock for thereby engaging the same;

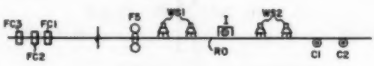
means for attaching one end of said element to one end of said cover; and

a padlock having a housing and a shackle extending from said housing, wherein said shackle is attached to said hollow cover at the opposite end thereof to be partially disposed within said hollow interior space and to extend through said cover to the outside of said hollow interior space for supporting said padlock housing outside of said cover, wherein the padlock may be unlocked to expose a free leg of said shackle outside of said cover, and wherein said padlock is attached to said cover to form a unitary unit such that the cover may be fitted over a steering lock about a steering column and the flexible element may be quickly and easily attached to the exposed, free leg of the shackle of the padlock with the cover in place and resting against the steering column.

4,505,141
APPARATUS FOR THERMOMECHANICALLY ROLLING HOT STRIP PRODUCT TO A CONTROLLED MICROSTRUCTURE

John E. Thomas, Pittsburgh; Ronald D. Gretz, Tarentum, and George W. Tippins, Pittsburgh, all of Pa., assignors to Tippins Machinery Company, Inc., Pittsburgh, Pa.

Filed Jul. 13, 1982, Ser. No. 397,789
Int. Cl.³ B21B 45/02, 9/00
U.S. Cl. 72—38 10 Claims



1. In a hot strip mill for reducing a slab to a hot strip including a final reducing stand and runout cooling means downstream thereof, the improvement comprising an in-line heat treating furnace capable of coiling and decoiling the hot strip and achieving a controlled microstructure to impart preselected metallurgical properties located intermediate the runout cooling means to define first cooling means upstream of said heat treating furnace and second cooling means downstream of said heat treating furnace.

4,505,142
FLEXIBLE HIGH PRESSURE CONDUIT AND HYDRAULIC TOOL FOR SWAGING

John W. Kelly, La Canada, Calif., assignor to Haskel, Inc., Burbank, Calif.

Filed Aug. 12, 1983, Ser. No. 522,518
Int. Cl.³ B21D 22/10
U.S. Cl. 72—54 12 Claims

1. A high-pressure hydraulic tool for applying fluid pressure to apparatus, comprising:

a source of hydraulic pressure for producing a fluid pressure of at least about 30,000 psi;

adaptor means for connecting to the apparatus;

a lengthwise-flexible, hollow delivery conduit having no

joints therein, and having an outer diameter of about one-eighth inch or less and an inner diameter of from about 0.01 inch to about 0.05 inch, said conduit being fabricated from a metal having a tensile strength sufficiently great that said conduit will not fail when pressurized to at least about 30,000 psi;

a first connector between one end of said conduit and said adaptor means, said first connector having first swivel means for swivelably connecting said conduit to said adaptor means;

a second connector between the other end of said conduit and said source of hydraulic pressure; and

means positioned between the apparatus and said conduit, said means preventing the flow of residue from said apparatus into said conduit so that the flow of fluid in said conduit is not impeded by residue remaining in said conduit from prior pressurizations.

4,505,143

WIDE PANEL, PANEL ASSEMBLY, AND PANEL FORMING APPARATUS

Gary A. Knudson, 17356 W. 57th Ave., Golden, Colo. 80401

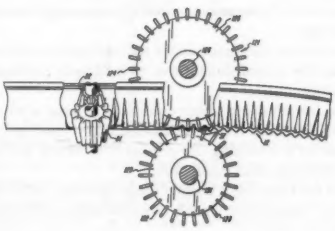
PCT No. PCT/US82/00212, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/02914, PCT Pub. Date Sep. 2, 1982

Continuation-in-part of Ser. No. 236,832, Feb. 23, 1981, Pat. No. 4,364,253. This PCT application Feb. 19, 1982, Ser. No. 441,511

The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.³ B21D *47/00*

U.S. Cl. 72—187 **6 Claims**



1. In a panel forming apparatus for producing a curved panel from a straight panel having upwardly inclined sidewall portions extending from an intermediate wall portion, the combination comprising:

first and second pairs of wall-indenting dies spaced from one another and free to rotate independently of one another to receive therebetween each inclined sidewall portion of a straight panel,

said pairs of wall-indenting dies being mounted for free rotation about an axis in an idle mode of operation;

a first hydraulic motor coupled by a power train to simultaneously rotate said first pair of wall-indenting dies at the same speed in a power mode of operation;

a second hydraulic motor coupled by a second power train to simultaneously rotate said second pair of wall-indenting dies at the same speed in a power mode of operation;

a third pair of wall-indenting dies located downstream of, free to rotate independently of, and in line with said first and second pairs of wall-indenting dies arranged to receive the intermediate wall portion of the panel between each of said third pairs and engage said intermediate wall portion of the panel after it has passed through said first and second pairs of wall-indenting dies,

said third pair of wall-indenting dies being mounted for free rotation about an axis in an idle mode of operation;

a third hydraulic motor coupled by a third power train to simultaneously rotate said third pair of wall-indenting dies at the same speed;

fluid supply means for delivering fluid under pressure to said motors; and

control means for said fluid including a first control valve for controlling the fluid to said first and second hydraulic motors and a second control valve for controlling the fluid to said third hydraulic motor, each of said control valves having an idle setting and a power setting whereby, in operation, during start-up said first and second pairs of wall-indenting dies are powered and said third pair is idling and, after said panel is passed between said third pair of work-indenting dies, said third pair is powered to form said indentations when said panel is passed continuously through said pairs of indenting dies.

4,505,144

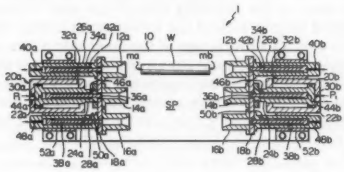
APPARATUS FOR SIMULTANEOUS BOTH-END SHAPING OF WORKPIECE

Kazuyoshi Sakuma, Hidakamachi; Tetsuo Nihei, Ooimachi, and Toshio Maki, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,505

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—345 **9 Claims**



1. An apparatus for simultaneously shaping both ends of an elongate workpiece comprising:

a pair of die means for shaping both ends of the workpiece to a predetermined configuration;

a pair of drive means each for driving respective ones of said die means for reciprocation toward and away from an associated one of both ends of the workpiece;

a pair of support means each operably associated with a respective one of said die means for supporting the workpiece fixed in place with respect to said die means during a shaping operation;

means for fixing one of said support means against movement relative to its die means during the shaping operation; and

pressuring means for pressuring one of the support means movably afloat relative to its die means yieldably to engage an elongated end of the workpiece during the shaping operation,

whereby during the shaping operation, said pressuring means pressures the one support means against the associated one of the ends of the workpiece so as to bring the one support means movably afloat relative to one of the drive means; and

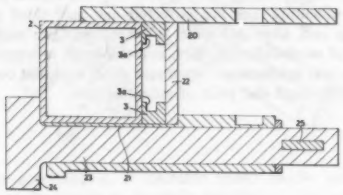
during the shaping operation, the other of the support means is maintained fixed relative to the other of the drive means.

4,505,145

EQUIPMENT FOR STRAIGHTENING DEFORMED VEHICLES OR VEHICLE PARTS

Hans R. Bergström, Kungsör, and Uno Johansson, Linköping, both of Sweden, assignors to AB Samefa, Kungsör, Sweden

Filed May 24, 1982, Ser. No. 381,637
Claims priority, application Sweden, May 26, 1981, 8103295
Int. Cl.³ B21D *1/14*
U.S. Cl. 72—457 **1 Claim**



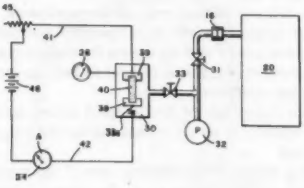
1. Apparatus for straightening deformed vehicles or vehicle parts comprising: a frame of beams on which the vehicle is fastened; a straightening device for applying tractive forces to the vehicle; and a fastening device fastening the straightening device to the frame, said fastening device being in abutting engagement with the upper, lower and outer sides of a frame beam and having a U-shaped cross-section including an upper and a lower plate and an intermediate plate that joins the upper and lower plates at some distance from their ends, said fastening device adapted to be brought into contact with the upper, lower and outer sides of a frame beam and including an arm device and a vertical shaft extending between said upper and lower plate to pivotally receive said arm device, said arm device being lockable in predetermined angles with respect to the frame so that tractive force can be applied to the vehicle, said lower plate of the fastening device carrying a blocking means adapted to grip around the lower, inner corner of the beam and to contact a lower part of the inner side of the beam and thereby lock the fastening device to the beam, said blocking means including a head to engage the lower, inner corner of the beam and being movable relative to said lower plate to permit close contact with the beam, and means on said blocking means to lock said blocking means in position.

4,505,146

PORTABLE SF_6 DECOMPOSITION SENSOR

Kamal E. B. Miners, Niagara Falls, Canada, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 16, 1983, Ser. No. 505,017
Int. Cl.³ G01N *27/12*
U.S. Cl. 73—19 **4 Claims**



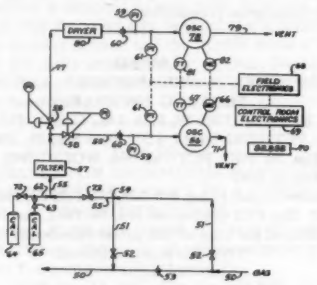
1. A portable apparatus for detecting the degree of SF_6 gas decontamination present in electrical equipment comprising means to connect and obtain a sample of SF_6 gas from said equipment; a test chamber into which said sample in a measure quantity is introduced; a test cartridge of a composition sensitive to, and whose electrical resistivity is altered by exposure to, SF_6 gas by-products mounted in said chamber between a low voltage contact and a high voltage contact; a direct current power source connected to said high voltage contact; and a nano-ammeter connected to said low voltage contact to detect the change in resistivity through said cartridge when a power supply is introduced through said high voltage contact.

4,505,147

HUMIDITY MONITOR AND METHOD

Paul J. Kuchar, Hinsdale; Robert W. Sampson, Arlington Heights, and Ronald F. Pacanowski, Hoffman Estates, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Feb. 22, 1983, Ser. No. 468,793
Int. Cl.³ G01N *31/00*
U.S. Cl. 73—29 **12 Claims**



1. Apparatus for determining moisture content of a sample of gas comprising:

(a) a first fluidic oscillator and a second fluidic oscillator;

(b) means for establishing flow of a sample through said oscillators;

(c) means for adjusting water content of at least a portion of the sample before it passes through said second oscillator;

(d) means for controlling the pressures at which the sample passes through said oscillators;

(e) means for measuring sample temperatures at said oscillators and transmitting signals representative of the temperatures;

(f) means for measuring the frequencies of oscillation at said oscillators and transmitting signals representative of the frequencies;

(g) computing means for calculating the moisture content of the sample using equations and data stored in said computing means and using data supplied by said means for providing temperature and frequency signals; and,

(h) means for communicating information contained in said computing means.

4,505,148

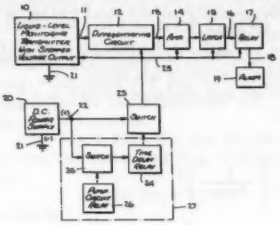
LEAK DETECTION SYSTEM

Chester J. Zajac, Litchfield, Conn., assignor to Transamerica DeLaval, Inc., Princeton, N.J.

Filed Aug. 22, 1983, Ser. No. 525,285
Int. Cl.³ G01M *3/32*; G01F *23/10*
U.S. Cl. 73—49.2 **12 Claims**

1. A leak detection system for providing an indication of fluid leakage from a receptacle in which liquid level is monitored by a float controlled transmitter having a stepped voltage output in response to changes in liquid level, said system comprising in combination means for differentiating a voltage signal, said means having an input for coupling to an electrical output of said transmitter and having an output for providing

a voltage pulse upon occurrence of a transition in said stepped voltage output, and means coupled to said output of the differentiating means responsive to said voltage pulse for providing an indication of leakage.



4,505,149

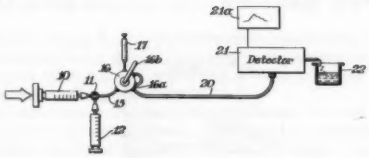
METHOD AND APPARATUS FOR DETERMINING MOLECULAR WEIGHT

Conrad N. Trumbore, Newark, Del., assignor to University of Delaware, Newark, Del.

Filed Jan. 24, 1983, Ser. No. 460,439

Int. Cl.³ G01N *31/08*

U.S. Cl. 73—53 **6 Claims**



1. A method of determining the molecular weight of an unidentified liquid component of given molecular weight by laminar flow under isothermal conditions, within about ±0.1° C., through a generally linear horizontal open bore capillary tube ranging from about 0.15 mm to about 1.5 mm inside diameter and about 10 cm to about 200 cm length open at the discharge end, according to N=24DL/F in the range of N=about 0.1 to N=about 10.0, where N=the number of theoretical plates in the capillary tube length, L=tube length, F=flow rate and D=the diffusion coefficient of said liquid component, thereby obtaining combined convection and molecular diffusion flow comprising injecting said liquid component within a preselected mobile liquid phase into said capillary tube in a plug sample no greater than about 0.1 the volume of said capillary tube preselected to obtain a chromatographic detector trace of said liquid component linear with concentration, with a signal/noise ratio sufficiently high to determine accurately the values of chromatograms verticals h_1 and h_2 referred to the chromatogram base line, at a preselected flow rate and a preselected length of said capillary tube interrelated to achieve a value of a ratio $R=h_1/h_2$ in the range of about 0.2 to about 7.0 versus molecular weight, obtaining a chromatogram of the eluted liquid component over a time period at least twice the break-through time, measuring said vertical heights h_1 and h_2 of said chromatogram at times t_1 equal to 1.2 times the break-through time and t_2 equal to 2.0 times the break-through time, respectively, computing said ratio R of said heights h_1 and h_2 and obtaining the molecular weight of said liquid component by reference to a standard plot of said ratio R versus known molecular weights for a multiplicity of different liquid component samples evaluated under the same conditions and with the same apparatus and mobile liquid phase as said liquid component in test, and lying within the range of analytical interest.

4,505,150

SENSING SURGES IN GAS TURBINE ENGINES

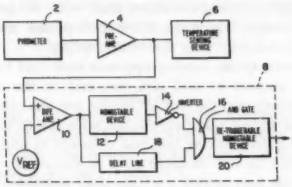
Stephen R. Seymour; Robert K. Guy, both of Bristol, and Paul N. Roberts, Weston-Super-Mare, all of England, assignors to Rolls-Royce Limited, London, England

Filed Dec. 10, 1982, Ser. No. 448,486

Claims priority, application United Kingdom, Dec. 30, 1981, 8139035

Int. Cl.³ G01J *5/34*; D02B *3/00*

U.S. Cl. 73—116 **14 Claims**



1. A circuit for sensing, from a pyrometer output signal representative of the temperature of a turbine of a gas turbine engine, a surge in the engine, the circuit comprising:

level detector means for receiving the pyrometer output signal and producing an output signal when the pyrometer output signal exceeds a predetermined level; and

duration detector means for receiving the level detector means output signal and producing an output signal when the level detector means output signal has lasted for more than a predetermined duration,

the predetermined level and the predetermined duration being so arranged that the duration detector means output signal is unresponsive to spurious pulses in the pyrometer output signal, but is responsive to an initial pulse characteristic of a surge in the engine.

4,505,151

POSITION INDICATOR WHICH CAN BE COUPLED TO A GAS PEDAL IN ORDER TO CONTROL THE SPEED OF TRAVEL OF AN AUTOMOTIVE VEHICLE

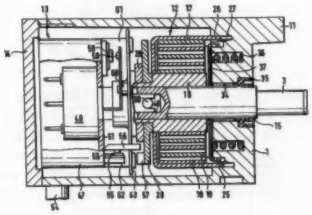
Wolfgang Sauerschell, Oberursel; Gerhard Ruschek, Hattersheim, and Arnold Mann, Biebergemünd, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,536

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215167

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—116 **15 Claims**



1. In a position indicator couplable to a gas pedal for controlling the speed of travel of an automotive vehicle by electric correlation of the movement of the gas pedal to an element which controls the fuel/air mixture, having a housing with a substantially cylindrical hollow inner space within which a rotary resistor is arranged, the rotary resister having two parts relatively movable with respect to each other, one part of the rotary resistor being secured against turning, in a mount which

is fastenable to the housing while the other part of the rotary resistor is connected with a member which is mounted turnable in the cylindrical hollow inner space about an axis and is turnable against a force of at least one return spring by the gas pedal and is provided with actuating means for actuating an electric kick-down switch, having contacts and being connected with the housing, in the axial direction upon the turning of said member by a predetermined amount, the improvement wherein

a first assembly comprises a drive shaft,

means for coupling the drive shaft with the gas pedal,

a pot through which the drive shaft passes, said pot having a slot and receiving the return spring,

said return spring having opposite ends and being turnable with respect to said pot, one end of the return spring extending into the slot of the pot and the other end of the return spring being connected with the drive shaft,

the drive shaft having one end disposed in said housing and coupled to the turnable part of the rotary resistor, the turnable part having a setting shaft and the rotary resistor having a first portion surrounding the setting shaft,

means comprising a switch disk for actuating the kick-down switch contacts, said switch disk is movable with said end of the drive shaft,

a second assembly comprises a hollow insulating base having a hollow space receiving the non-turnable part of the rotary resistor in non-turnable manner and having an end portion acting as a support for the contacts of the kick-down switch wherein one of the contacts is actuatable by the switch disk and protrudes from the end portion of the insulating base,

a spring washer with a central bushing arranged such that the first portion of the rotary resistor is inserted through the end portion of the insulating base,

the second assembly by means of the setting shaft is connected coaxially with the drive shaft in the housing, the first assembly being inserted in the housing and restrained from turning in the housing by the return spring, and

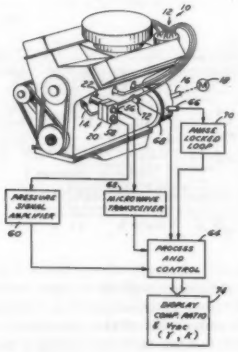
said housing has an opening, the drive shaft having a first section passing through said opening in the housing.

4,505,152

METHOD AND APPARATUS FOR MEASURING ENGINE COMPRESSION RATIO

Mark L. Haddox, Ann Arbor, Mich., assignor to Jodon Engineering Associates, Inc., Ann Arbor, Mich.

Filed Sep. 13, 1982, Ser. No. 416,852
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—117.2 **19 Claims**



8. A method of measuring clearance volume V_{TDC} within the cylinder of an internal combustion engine having a piston disposed to reciprocate within said cylinder and a crankshaft coupled to said piston, said method comprising the steps of:

(a) identifying a first angular position θ_{TDC} of said crankshaft corresponding to top dead center of said piston within said cylinder,

(b) measuring pressure P_{TDC} within said cylinder at said top dead center position of said piston, and

(c) determining said clearance volume as a function of the equation:

$$V_{TDC} = \left[\frac{k}{P_{TDC}}\right]^{\frac{1}{\gamma}}$$

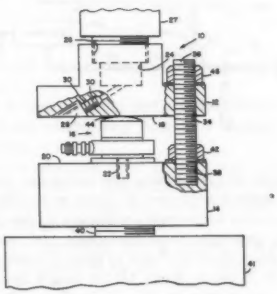
where k and γ are constants for a given cylinder.

4,505,153

RECOIL TRANSDUCER FIXTURE

Jay S. Lilley, and Jerrold H. Arszman, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 10, 1983, Ser. No. 502,907
Int. Cl.³ G01L *5/14*
U.S. Cl. 73—117.4 **1 Claim**



1. A recoil fixture for determining force responses in a propulsion device at high frequency comprising:

a. a pair of plates including a loading plate and a base plate disposed in spaced relation, said loading plate adapted to receive said propulsion device whose force responses are to be determined;

b. an impact transducer rigidly mounted between said loading plate and said base plate;

c. means for preloading said impact transducer to a predetermined value, said means including studs secured in threaded relation in said base plates, said studs extending through said loading plate, and loading nuts in engagement with said loading plate and disposed in threaded relation with said studs, said studs being spaced 120° apart in said fixture;

d. a first mounting stud secured to said transducer and disposed for secured relation in said base plate to secure said transducer thereto;

e. said loading plate being provided with a cavity to receive said propulsion device therein and a passage to receive igniter leads therein, said igniter leads disposed for ignition of said propulsion device; and,

f. a second mounting stud, said second mounting stud secured to said base plate and disposed for secured relation to a test stand.

4,505,154

CONTACTLESS MEASURING DEVICE FOR REAL-TIME DETECTION OF THE PROPERTIES AND QUANTITIES RESPECTIVELY CHARACTERISTIC OF THE SEPARATION OF VOLUMES OF LIQUID AND THE SPLITTING OF LAYERS OF LIQUID IN THE NIPS FORMED BY THE ROLLERS ON PRINTING MACHINES

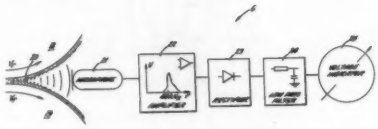
Reiner Wiesner, Weiterstadt, Fed. Rep. of Germany, assignor to Forschungsgesellschaft Druckmaschinen e.V., Franfurt am Main, Fed. Rep. of Germany

Filed Feb. 9, 1983, Ser. No. 465,209

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205941

Int. Cl.³ B41F *7/24*

U.S. Cl. 73—150 R **20 Claims**



1. A contactless measuring device for sensing splitting of a volume of liquid in a nip formed by rollers in a machine, said measuring device providing real-time detection of properties of the liquid that are characteristic of the process of said splitting such as viscosity, elasticity, interfacial tension and the like, said contactless measuring device commprising, in combination,

acoustic sensing means disposed near the outlet of the nip for receiving sonic signals generated by the separation of the liquid in the nip and generating an electrical signal representative of the sonic signals, and

electronic means for evaluating the electrical signal generated by the acoustic sensing means and for generating an electrical signal responsive to said evaluation indicating said properties of the liquid that are characteristic of said splitting process.

4,505,155

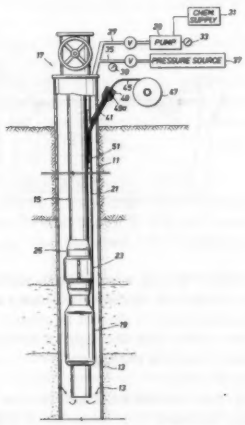
BOREHOLE PRESSURE MEASURING SYSTEM

Joshua M. Jackson, Houston, Tex., assignor to Sperry-Sun, Inc., Sugarland, Tex.

Continuation of Ser. No. 282,449, Jul. 13, 1981, abandoned. This application Oct. 11, 1983, Ser. No. 540,297

Int. Cl.³ E21B *47/06*

U.S. Cl. 73—151 **20 Claims**



1. In a borehole fluid production system including a pipe string extending from the surface to a downhole location, means suitable for both injecting chemicals into the system downhole and for making downhole pressure measurements, comprising:

a tubular member attachable to the pipe string and extending from the surface to the downhole location, said tubular member sized to accommodate the injection of treating materials into the production system at said downhole location; and

means insertable into the tubular member for substantially restricting the cross-sectional area and total volume of the bore of the tubular member to thereby facilitate the measurement of downhole pressure.

4,505,156

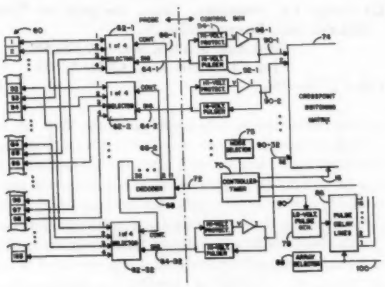
METHOD AND APPARATUS FOR SWITCHING MULTI-ELEMENT TRANSDUCER ARRAYS

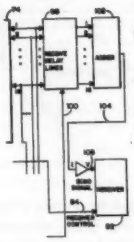
Warren O. Questo, Orangevale, Calif., assignor to Sound Products Company L.P., New York, N.Y.

Filed Jun. 21, 1983, Ser. No. 506,499

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—626 **14 Claims**





1. In an ultrasonic apparatus including a transducer composed of n elements activated in groups of m at a time, the activation of each of said m elements being subject to one of m/2 separate time delays, a switching system for connecting said groups of elements to pulsing means and to receiving means in accordance with a predetermined pattern sequence, said switching system comprising;

(a) m concentrator means;

(b) n element lines each connected to one of said transducer elements and to said concentrator means;

(c) crosspoint switching means;

(d) m intermediate lines each connected to one of said concentrator means and to said crosspoint switching means;

(e) m/2 pulse delay means;

(f) m/2 receive delay means;

(g) m/2 input-output lines each connected to said crosspoint

switching means, to one of said pulse delay means, and to one of said receive delay means; and

(h) control means connected to said concentrator means and said crosspoint switching means;

(i) said crosspoint switching means being arranged to connect each of said input-output lines to at least one of said intermediate lines, and said concentrator means each being arranged to connect said intermediate line connected thereto to one of said element lines connected thereto, in accordance with said pattern sequence as determined by said control means.

4,505,157

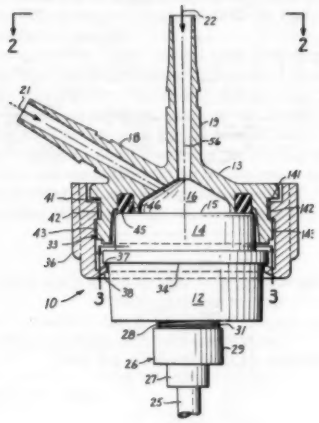
TRANSDUCERS WITH QUICK DOME CONNECT SYSTEMS

Da Hong Le, Pasadena, Calif., assignor to Transamerica DeLaval Inc., Lawrenceville, N.J.

Filed Aug. 5, 1983, Ser. No. 520,680

Int. Cl.³ A61B *5/02;* **G01L** *19/00*

U.S. Cl. 73—756 **20 Claims**



11. A system for interconnecting a transducer body with a fluid-receiving transducer dome, comprising, in combination:

a radial shoulder on said transducer body;

an annular tightening member around said transducer body at said radial shoulder and rotatable relative to said transducer body;

a groove in one of said tightening member and said dome for receiving a fastening member projecting from the other of said tightening member and said dome;

a stepped rigid tongue delimiting said groove for retaining said fastening member in said groove; and

means for providing between said tightening member and said radial shoulder an axial bias resiliently restraining said tightening member and said transducer body against movement away from each other and for biasing said dome and said transducer body into fluid-tight engagement with said axial bias acting between said radial shoulder and said annular tightening member and acting on said dome through said projecting fastening member and rigid tongue.

4,505,158

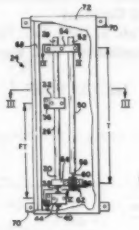
THERMAL COMPENSATING GAGE

Stephen S. Maples, Adrian, Mich., assignor to Acer Automation Company, Adrian, Mich.

Filed Jun. 29, 1983, Ser. No. 508,818

Int. Cl.³ G01B *5/30;* **G01L** *1/14*

U.S. Cl. 73—766 **12 Claims**



1. A temperature compensated measuring system for measuring linear stress variations within a thermally expandable and contractable metal element stressed in a given direction comprising in combination, a first dissimilar metal thermally expandable and contractable linear detector producing a first electrical signal proportional to the stress imposed upon the element in the given direction and the temperature of the element and of the first detector, a second dissimilar metal thermally expandable and contractable linear detector producing a second electrical signal inversely proportional to the temperature of said first detector, an electrical signal summing device connected to said first and second linear detectors receiving and processing said first and second signals to produce a third electrical signal representing the linear dimension of the metal element in the given direction free of thermal influence, and utilization means connected to said summing device utilizing the value of said third signal.

4,505,159

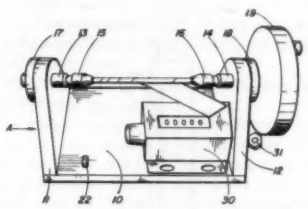
TESTING OF WIRE PRIOR TO PLATING

Stanley D. Entwistle, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 11, 1983, Ser. No. 474,443

Int. Cl.³ G01N *19/08*

U.S. Cl. 73—847 **5 Claims**



1. A method of testing wire prior to plating, comprising;

wrapping a length of tape spirally around a length of wire, at least an edge portion thereof in contact with the wire;

twisting the wire, and the tape, a number of times, in a direction to tighten the tape;

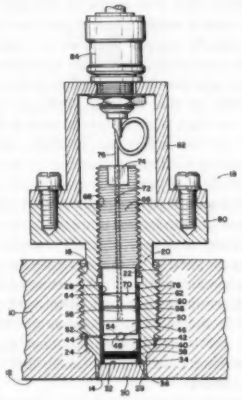
unwinding the tape;

inspecting said continuous edge portion of the tape and counting the number of particles of wire material which are attached to the tape, said particles having been removed from the wire.

4,505,160
HIGH-TEMPERATURE TRANSDUCER

Ellis M. Zacharias, Jr., Tulsa, Okla., assignor to Nusonics, Inc., Tulsa, Okla.

Filed Feb. 7, 1983, Ser. No. 464,416
Int. Cl.[3] G01F *1/66*; H04R *17/00*
U.S. Cl. 73—861.18 11 Claims



1. A transducer for transmitting and/or receiving sonic energy comprising:

a housing having a cylindrical opening having a forward end and rearward end, the cylindrical opening being internally threaded in the rearward portion;

an acoustic window member sealably closing the forward end of said cylindrical opening, the acoustic window having a planar rearward face;

a cylindrical transducer crystal element having a forward planar face in engagement with said acoustic window rearward face, and an opposed rearward face;

an externally threaded compression screw in said internally threaded portion of said cylindrical opening rearwardly of said transducer crystal element for applying force against said transducer crystal element rearward face to cause intimate contact of said transducer crystal element forward face and said acoustic window rearward face, such force being symmetrically applied by said compression screw axially of said cylindrical transducer crystal element;

a thrust transmitting sphere in the path of said axially applied force serving to ensure uniform load of force of said transducer crystal element against said acoustic window; and

means of providing separate electrical paths between said transducer crystal element forward and rearward faces.

4,505,161
MINERAL SAMPLE PRESERVATION PROCESS

Patricia K. Hunt, Solon, and Steven J. Waisala, Aurora, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 24, 1983, Ser. No. 478,381
Int. Cl.[3] G01N *1/28*
U.S. Cl. 73—863 19 Claims

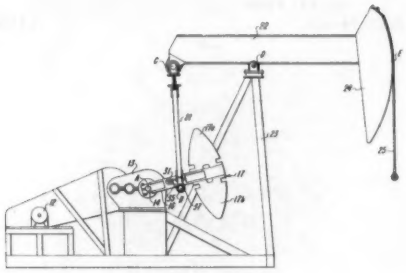
1. A process for preserving mineral samples comprising:

sealing said sample within a material comprising a nitrile oxygen barrier resin formed by the polymerization of 55 to 90 weight percent of an olefinically unsaturated monomernitrile with a remaining proportion of at least one monovinyl monomer copolymerizable with said nitrile optionally in the presence of a preformed diene rubber.

4,505,162
OIL WELL PUMPING APPARATUS AND METHOD

Thomas G. Hoh, Boulder, Colo.; Bernard L. Friedman, Carmel Valley, Calif.; Wendall Borchert, Boulder, and Eugene H. Nixon, Jr., Arvada, both of Colo., assignors to Advanced Pumping Systems, Inc., Lafayette, Colo.

Filed Jul. 22, 1982, Ser. No. 400,637
Int. Cl.[3] F04B *47/02*
U.S. Cl. 74—41 15 Claims



1. In an oil well pumping apparatus, a universal linkage usable throughout a range of strokes and throughout a range of gear reducer torque ratings for a selected peak load capacity, said pumping apparatus having a walking beam pivotal up and down a saddle pivot, said beam having a horsehead at the front end and carrying a polished rod and sucker rods via a bridle for extending from the horsehead into the oil well to drive a downhole pump, at least one crank rotatable at one end adapted to be driven by a prime mover about a fixed axis via a gear reducer subject to gear reducer load reversals during at least a portion of each stroke using a conventional linkage, said crank arm having a counterbalance weight mounted thereon opposite said axis of rotation, and a pitman rod pivotally connected at one end to a rear end portion of said walking beam at an equalizer pivot and to the crank arm at its opposite end, said universal linkage being characterized by the combination of:

a walking beam distance ratio of saddle pivot-polished rod distance to saddle pivot-equalizer pivot distance of at least 1.4:1 and a positioning of said crank arm axis to the rear of said equalizer pivot by an amount at least equal to 15% of the saddle pivot-equalizer pivot distance; and

offset coupling means for connecting said pitman rod to said crank arm at a selected point for a selected stroke along a crank arm wrist pin angle line offset at an angle of between 5° and 20° to the center line of said crank arm, said offset coupling means including an inclined slot in an intermediate portion of said crank arm, said slot being inclined at an angle of between about 5° and 20° to the longitudinal center line of the crank arm, and a wrist pin assembly pivotally connected to the pitman rod and slidably mounted in said slot and lockable at any point along said slot, so that said counterweight trails said crank arm by said angle upon the rotation of said crank arm, in conjunction with counterbalancing provided by a selected torque arm distance and a selected amount of counterbalance weight on said crank arm for a given oil well loading profile, said selected point being variable to any setting of a continuous range of settings along said crank arm wrist pin angle line to change the stroke, whereby to reduce the peak torque requirements, eliminate gear reducer load reversals, and lower sucker rod stress during the operation of the pumping unit.

4,505,163

MECHANISM WITH CONTINUOUS ADJUSTMENT FOR THE TRANSMISSION OF A ROTARY MOTION BETWEEN TWO COAXIAL SHAFTS

Raimund Falkner, A6426 Roppen Nr. 64, Austria

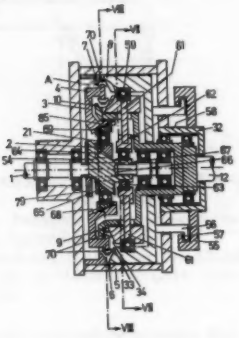
PCT No. PCT/AT81/00011, § 371 Date Jan. 21, 1982, § 102(e) Date Jan. 21, 1982, PCT Pub. No. WO81/03367, PCT Pub. Date Nov. 26, 1981

PCT Filed May 21, 1981, Ser. No. 346,081

Claims priority, application Austria, May 23, 1980, PCT/AT80/00016

Int. Cl.³ F16H *21/12, 21/48, 25/08, 15/00*

U.S. Cl. 74—63 13 Claims



1. A mechanism with continuous adjustment for the transmission of a rotary motion between an input shaft and a coaxial output shaft comprising a casing, a first concentric wheel rotatably fixed relative to said casing and having two first wheel rims with first conical transmission surfaces, a second wheel concentrically arranged on said output shaft, said second wheel having two second wheel rims with second conical transmission surfaces, the axial distance between said first wheel rims as well as between said second wheel rims being adjustable, all conical transmission surfaces of said two wheels being provided with a toothing formed by substantially radially extending grooves and by ribs being arranged between said grooves, said grooves and said ribs of said two transmission surfaces of each of said wheels lying alternately opposite one another, and a radially displaceable ring being rotatably mounted on a hub adapted to move with said input shaft and having two arrays of axially free toothing elements meshing with said grooves of said first and said second conical transmission surfaces, said toothing elements being formed by sets of lamellas individually displaceable parallel to the axis and each of said lamellas projecting from said ring by the depth of one of said grooves, the area of contact between one of said arrays and said first wheel rims being offset by 180° from the area of contact between the other of said arrays and said second wheel rims.

4,505,164

AUTOMATIC TRANSMISSION MECHANISM WITH SPINDLE-SHAPED FRICTIONAL CLUTCH MEMBERS INCORPORATED THEREIN

Tokuichiro Yoshida, 13-14 Ise-cho, Kawasaki-ku, Kawasaki 210, Japan

Filed Oct. 8, 1981, Ser. No. 309,689

Int. Cl.³ F16H *3/08*

U.S. Cl. 74—371 4 Claims

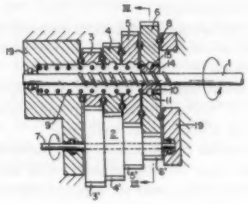
1. An automatic transmission mechanism with a plurality of spindle-shaped frictional clutch members incorporated therein comprising:

(A) a casing having a front wall portion and a rear wall portion,

(B) two gear assemblies contained in said casing, comprising a first gear assembly meshing with a second gear assembly, wherein said first gear assembly comprises a plurality of coaxial gear elements through which an engine output shaft extends, each of said gear elements having a different diameter in such a manner that the gear element adjacent the front wall portion has the largest diameter and the gear element adjacent the rear wall portion has the smallest diameter, said gear elements having a large bore to receive a clutch holder therein and having a plurality of recesses equally spaced apart in an inner wall thereof, while said second gear assembly comprises a single solid multi-stage gear assembly, containing the same number of gear sections as that of gear elements in the first gear assembly, through which a driven shaft is fixedly extended in parallel to the engine output shaft, each of said gear sections having a different diameter in such a manner that the gear section adjacent the front wall portion has the smallest diameter and the gear section adjacent the rear wall portion has the largest diameter so that a certain gear element in the first gear assembly meshes with a corresponding gear section in the second gear assembly,

(C) said gear elements in the first gear assembly being freely rotatable separately from each other with the aid of bearing means in the form of a number of balls disposed between the side faces of two adjacent gear elements or between the inner wall of the casing and the side wall of the gear element,

(D) a clutch holder having an axial width essentially corresponding to the thickness of a single gear element and being axially slideably disposed in said large bore and having an axial bore,



(E) said engine output shaft having a screw thread formed thereon across the width of the first gear assembly so that said clutch holder is axially displaceably mounted with a spiral groove formed on the inner wall of the axial bore corresponding to said screw thread on the engine output shaft,

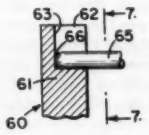
(F) said clutch holder having recesses located at an equal angular distance in each of which a spindle-shaped clutch member is radially displaceably received to ensure a frictional contact against the corresponding annular groove on the inner wall of the bore of the respective gear elements, said spindle-shaped clutch member being rotatably supported by means of a pin extending therethrough of which both ends are resiliently supported by means of spring means, and

(G) a coil spring contained in the hollow space defined by the bores of the gear elements of the first gear assembly, of which one end abuts against a side wall portion of the casing and of which the other end comes in contact with one side face of the clutch holder so that prior to a starting operation the clutch holder is located in the bore of the gear element adjacent the front wall portion in the first gear assembly and the coil spring is compressed in correspondence with the axial displacement of the clutch holder squeezed by way of the screw thread due to a torque load from the second gear assembly.

4,505,165
TRACKBALL DEVICE

Max Wiczer, Skokie, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Jun. 1, 1982, Ser. No. 383,719
Int. Cl.³ G05G 9/00, 13/00; F16H 13/00
U.S. Cl. 74—471 XY 1 Claim

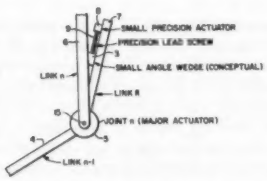


1. In a trackball device including a housing having a circular opening therein, a plurality of rotatable supports in the housing, a ball seated on the supports with a portion of the ball projecting through the opening for manual rotation by a user, and means associated with the supports for generating control signals, the improvement being that each support includes a pair of spaced-apart support blocks and a cylindrical shaft, each of said blocks having a part-cylindrical cradle surface completely closed at one end thereof by a flat planar bearing surface, said blocks being disposed so that said cradle surfaces are coaxial and said bearing surfaces are parallel, said shaft being carried by said cradle surfaces, said shaft having part-spherical journals at the ends thereof respectively engaging said bearing surfaces in substantially point contact therewith, the radius of said shaft being substantially less than the radius of curvature of each of said cradle surfaces so as to cause said shaft to make substantially line contact with the associated cradle surfaces.

4,505,166
CONTROL-IN-THE-SMALL SYSTEM FOR PRECISION, UNDER LOAD CONTROL OF ROBOT MANIPULATOR

Delbert Tesar, Gainsville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed Mar. 30, 1982, Ser. No. 363,457
Int. Cl.³ B25J 3/04; G05G 11/00
U.S. Cl. 74—479 22 Claims



1. An arrangement for controlling the position of an end-effector supported by a robotic load-bearing link arrangement comprising:

primary link displacement actuator means, coupled with and effectively participating in the load-bearing action of said link arrangement, for effecting a coarse positioning of said end effector in accordance with a first control command supplied thereto; and

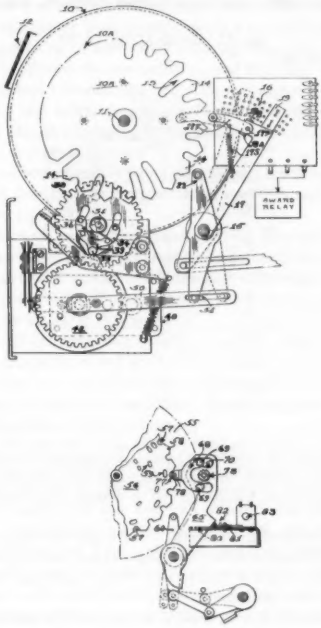
secondary link displacement actuator means, coupled with but effectively not-participating in the load-bearing action of said link arrangement, for effecting a precise positioning of said end-effector in accordance with a second control command supplied thereto;

whereby the degree of precision to which the position of said end-effector may be controlled is effectively independent of the load-bearing action of said link arrangement.

4,505,167
FLOATING PAWL STRUCTURE PROVIDING COMPOUND ANGULAR YIELDABILITY

Frank G. Nicolaus, Chicago, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 891,310, Mar. 29, 1978, Pat. No. 4,411,428. This application Dec. 6, 1982, Ser. No. 447,246
Int. Cl.³ A63F 5/04; F16D 49/00
U.S. Cl. 74—577 R 11 Claims



8. A multi-directionally yieldable pawl mechanism for driving and indexing engagement with or by cooperative toothed and notched loading members, said mechanism comprising a moveable host member; a pawl and means shiftably mounting the same on a land area on said host member for yielding retreating movement away from and return to a normal operating position; multi-directionally-acting spring means applying forces acting on said pawl relative to a reference axis through said normal position to urge it in a direction generally toward and into said normal position from any of a plurality of displaced mode positions within a predetermined range away from said normal position; said range being of a character permitting linear, angular and compound linear and angular modes of displacements of the pawl in retreating from said normal position and being determined by coacting guide means on the pawl and host member of a character affording increasing linear, angular and compound freedom of retreating displacement of the pawl in the general direction away from said normal position in variant reaction to driving and indexing loading on the pawl; said guide means being further operative in the direction of movement of the pawl back toward said normal position responsive to urgence of said spring means to increasingly confine and resultantly direct the movement of the displaced pawl back into said predetermined normal position in the absence of any extraneous loading or like opposition to the action of the spring means sufficient to prevent such return movement; the cooperative action of said spring means and said guide means being such that said pawl is also capable

of substantial rocking motion crosswise of said axis in said normal position.

4,505,168

VEHICLE STEERING SYSTEM

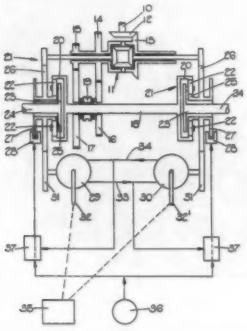
Stanley H. Booth, Huntington, and John C. E. Flint, Stroud, both of England, assignors to Commercial Hydraulics Gloucester Ltd., Aldwych, England

Filed Jan. 26, 1983, Ser. No. 461,226

Claims priority, application United Kingdom, Jan. 8, 1983, 8300483

Int. Cl.[3] **B62D** *11/08, 11/10*

U.S. Cl. 74—687 **17 Claims**



1. A system for steering a vehicle in response to a steering demand, said vehicle having on opposite sides thereof motive units selected from tracks and sets of wheels, said system comprising:

(a) a differential drive means for driving said motive units, said differential drive including a hydrostatic transmission operatively connected to said motive units and having a hydrostatic pressure;

(b) control means, operative in response to said steering demand, for driving said hydrostatic transmission to drive said motive units on opposite sides of said vehicle at different relative speeds and for producing a steering action on said vehicle; and

(c) brake means, operative in response to said hyudrostatic pressure exceeding a predetermined level, for applying a braking effect to an appropriate one of said motive units and for supplementing said steering action, said braking effect being increased progressively with increases in said steering demand.

4,505,169

APPARATUS USING A CONTINUOUSLY VARIABLE TRANSMISSION TO IMPROVE FUEL ECONOMY

David P. Ganoung, 4406 Chickasaw Rd., Memphis, Tenn. 38117

Continuation-in-part of Ser. No. 205,625, Nov. 10, 1980, Pat. No. 4,383,456, which is a continuation-in-part of Ser. No. 20,916, Mar. 14, 1979, Pat. No. 4,280,469, which is a continuation-in-part of Ser. No. 767,060, Feb. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 616,640, Sep. 25, 1975, Pat. No. 4,023,641, said Ser. No. 205,625, is a continuation-in-part of Ser. No. 170,017, Jul. 18, 1980, Pat. No. 4,342,298. This application Dec. 20, 1982, Ser. No. 451,613

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

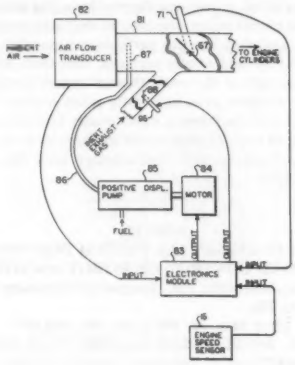
Int. Cl.[3] **B60K** *15/00, 20/16*

U.S. Cl. 74—858 **20 Claims**

1. Apparatus for improving the efficiency with which power is delivered to a load by a naturally-aspirated Otto engine controlled by a throttle valve device, the apparatus comprising:

fuel metering means having a wide open throttle calibration for automatically providing dilution of the air-fuel charge supplied to said engine when said throttle valve device is effectively wide open, said wide open throttle calibration extending substantially throughout the range from a minimum operating speed of said engine to the operating speed at which said engine develops maximum power, said minimum engine speed and said maximum power engine speed being boundaries of the majority of the operating speed range wherein said engine delivers power to said load, the major portion by weight of said air-fuel dilution consisting of recirculated exhaust gas, and said air-fuel dilution displacing a least 10% by weight of the fuel in said air-fuel charge as compared to otherwise identical operation of said engine with an undiluted stoichiometric air-fuel charge, said displacement of at least 10% existing substantially throughout said engine operating speed range of said wide open throttle calibration, whereby the combustion temperatures during relatively high torque operation of said engine are lowered,

a continuously variable ratio transmission which transfers mechanical power from said engine to said load, said



transmission having a range of ratio which allows torque values commonly imposed on said engine through said transmission to balance the brake torque output from said engine when the following conditions exist concurrently: (1) said throttle valve device is effectively wide open, (2) said fuel metering means is operative to provide said dilution of the air-fuel charge and (3) the power necessary to drive said load allows said engine to operate well below said maximum power engine crankshaft speed, whereby said transmission ratio range may often be used in preference to throttling for regulating the engine power output, and

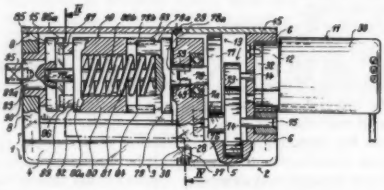
control system means for implementing effectively wide open throttle operation of said engine, said control system means comprising: (1) input means for selecting the desired operating speed of said engine, (2) ratio control means operative to adjust the ratio of said transmission to substantially eliminate the difference between the existing value of said desired operating speed and the actual operating speed of said engine, and (3) throttle control means operative to open said throttle valve device to an effectively wide open position when the operating speed of said engine is both substantially equal to the existing value of said desired operating speed and equal to or greater than said minimum engine operating speed.

4,505,170

HAND-HOLDABLE ELECTRIC POWER TOOL APPARATUS

Christiaan G. M. Van Laere, 86, Rainstrasse, 8038 Zürich, Switzerland

Filed Sep. 30, 1982, Ser. No. 430,763
Int. Cl.³ B25B 19/00
U.S. Cl. 81—464 6 Claims



1. An electric rotary tool apparatus holdable by hand during operation and comprising

(1) an electric motor comprising (a) a stator, (b) a rotor having a longitudinal rotor axis, (c) first and (d) second stationary contactor means, (e) a driving rotor shaft bearing said rotor, and (f) a motor housing containing in its interior said stator and rotor and comprising a surrounding hull, a forward end wall and a rearward end wall;

(a) said stator being mounted in the interior of said housing in said hull and being a permanent magnet of magnetic iron material, said permanent magnet comprising a north pole shoe and a south pole shoe of substantially semicylindrical configuration and having each a thickness of from about 5 to 6 mm, said pole shoes of said permanent magnet being concentrical with said longitudinal rotor axis; and opposite longitudinal gaps having each a circumferential width, in a radial plane, of about 33 mm, and separating said two pole shoes from one another; the length of said permanent magnet being from about 30 to 65 mm; and the radial diameter of the assembled rotor and two pole shoes taken together being about 43 mm;

said rotor consisting essentially of

(i) a generally drum-shaped armature on said rotor shaft and having a substantially cylindrical surface section coaxial with said longitudinal rotor axis and with an external diameter of about 32 mm and a length of from about 26 to 55 mm, said armature having 12 axially extending cutout channels parallel with said longitudinal rotor axis and opening out of said external surface section of said armature, the internal diameter of said armature between the deepest ends of every two diametrically opposite cutout channels being from about 16 to 17 mm,

(ii) a wiring of electrically conductive wire having a diameter of each individual wire cross section of from about 0.56 to 0.72 mm and comprising a plurality of wire portions, each of said channels containing about 32 of said wire portions, and

(iii) a collector comprising 12 collector segments and being mounted on said rotor shaft, the total length of wire amounting to from about 12 to about 24 meters;

said collector comprising brush means for collecting positive and negative electric current from said collector segments and being disposed in contact with said collector inside said motor hull, and said first and second stationary contactor means being electrically conductively connected with said brush means and extending from the latter toward said rear end wall of said motor hull and extending through said rear end wall to be contactable from the outside thereof;

(2) a casing to which said motor is attached, comprising base part means adapted for being carried by the user's hand,

(3) a speed-reducing unit in said casing and comprising a gear transmission having an input side positively and drivingly connected to said driving motor shaft, and an output side, and being adapted for directly and uninterruptedly transmitting torque from the driving motor shaft to said output side;

(4) a driven shaft connected to said output side of said speed-reducing unit;

said speed-reducing unit reducing the speed of said driving shaft to that of said driven shaft in a ratio of from about 7:1 to about 12:1;

said rotor shaft being rotatably mounted in said forward end wall of said motor housing and having a free end connectable to the input side of said speed-reducing unit, said rotor shaft and said collector thereon being housed in a zone of said surrounding hull between said end wall, said motor housing and an end of said wiring facing toward said rear end wall;

(5) an impact-producing unit connected to said driven shaft for rotation therewith,

(6) tool socket means being adapted for receiving a socket tool thereon and connected with said impact-producing unit; and

(7) an on-off and reversing switch being adapted for switching a direct electric current having an electric potential of from 8 to 30 volts and an amperage sufficient for affording a power input of said motor of 180 watt and, under load, of about 300 to 900 watt;

said on-off and reversing switch comprising supporting cover means, spaced from and pivotally mounted on an external face of said rear end wall of said motor housing and having an inner and an outer face both extending substantially transversely to said longitudinal rotor axis; and

a pair of shiftable contactor means mounted in said cover means and extending from outside said outer face thereof through said cover means and protruding from the inner face thereof toward said rear end wall of said motor housing, said cover means having passage means for the introduction of a pair of lead means from a plus pole and a minus pole, respectively, of an automobile battery into an interspace between said rear end wall and said inner face of said cover means, and into electrically conductive engagement with a first and a second one, respectively, of said pair of shiftable contactor means, said shiftable contactor means being so disposed in said cover means as to be switched by corresponding turning of said cover means to adopt three different positions, in a first "off" one of which, parts of said shiftable contactor means at the inner face of said cover means are out of contact with both said first and second stationary contactor means, while in a second position, a first one of said shiftable contactor means makes contact with said first stationary contactor means lodged in said rear motor housing end wall on the outside thereof, and the second shiftable contactor means makes contact with said second stationary contactor means also on the outside of said rear end wall, thereby activating said motor for rotating said driving shaft in a given direction of rotation, and, in a third position, the second one of said shiftable contactor means makes contact with said first stationary contactor means, and the first shiftable contactor means makes contact with said second stationary contactor means, thereby reversing the direction of rotation of said motor and said driving shaft;

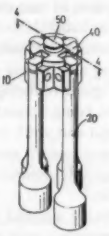
said impact-producing unit comprising an anvil having at least two anvil abutments, a hammer drum and at least two hammers thereon, a hammer shaft connected with said driven shaft, said hammer drum being axially displaceable along said hammer shaft, a drum spring supported in said impact-producing unit and adapted to urge said hammer drum and hammers into a position in which said hammers are enabled to impact upon said anvil abutments when said hammer shaft is rotated by said driven shaft.

4,505,171

FOLDABLE CROSS WRENCH

Chung-Hsing Chang, No. 70-3, Fong-Kuo Rd., Changhwa City, Taiwan

Filed Jul. 25, 1983, Ser. No. 516,876
Int. Cl.³ B25B 13/00
U.S. Cl. 81—177 B 4 Claims



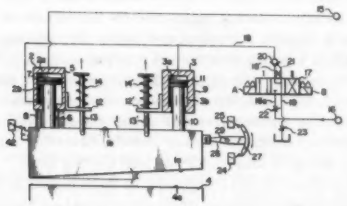
1. A foldable cross socket wrench comprising: a coupling member including a rigid block which is quartered into four sections, each two sections spaced apart with a slot, the top surface of each said sections being provided a first key way, positioned in a circle four wrench members each having a working head at a first end and a second end pivoted to said coupling member between two adjacent sections and received in said slot, said second end being provided with a second key way constituting a circular key way with said first key ways when said wrench members are in stretched position; a cap member releasably attached to said coupling member and provided with key elements on the bottom surface thereof for locking said wrench members in said stretched position by engaging with said second key ways, said cap also having slots for receiving the wrench members to release said wrench members as said cap member is rotated through a predetermined angle to a position where said key elements engage with said first key ways; and means for adjustably fastening said cap member in place whereby the tightness of engagement of said cap member against said coupling member can be adjusted.

4,505,172

SHEAR ANGLE ADJUSTING APPARATUS FOR SHEARING MACHINE

Hideaki Deguchi, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 428,708
Claims priority, application Japan, Oct. 20, 1981, 56-154779[U]
Int. Cl.³ B26D 5/08
U.S. Cl. 83—74 3 Claims



1. A shear angle adjusting apparatus for a shearing machine having upper and lower shearing cutters, the upper shearing cutter being adapted to be displaced relative to the lower shearing cutter, comprising:

a frame; first cylinder means mounted to said frame, said first cylinder means having mounted therein a piston and piston rod unit defining a head end and a rod end chamber therein, the piston rod of said first cylinder means being fixedly secured to one end upper surface of said upper cutter;

second cylinder means mounted to said frame, said second cylinder means having mounted therein a piston and piston rod unit defining a head end and a rod end chamber therein, the piston rod of said second cylinder means being fixedly secured to the other end upper surface of said upper cutter;

first source of pressurized fluid;

solenoid-operated valve means connected at its input side with said first source of pressurized fluid, output side of said solenoid-operated valve means being connected with the rod end chamber of said first cylinder means and the head end chamber of said second cylinder means;

means for detecting angular deflection of said upper cutter from a predetermined shear angle between said upper and lower cutters, said detecting means further comprising a rod pivotally mounted at an intermediate portion thereof to said frame, said rod having a dog at one end thereof between a first switch means and a second switch means and having the other end engaged with said upper cutter, said first switch means adapted to be switched on by said dog when the shear angle between said upper and lower cutters becomes too big and said second switch means adapted to be switched on by said dog when the shear angle becomes too small; and

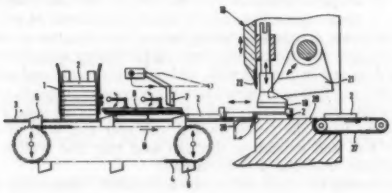
a pilot-opened check valve disposed in a conduit connecting the output side of said solenoid-operated valve means with the rod end chamber of said solenoid-operated valve means with the rod end chamber of said first cylinder means and the head end chamber of said second cylinder means, said check valve allowing a flow of fluid from said solenoid-operated valve means but normally blocking the flow of fluid in the opposite direction, said check valve when pilot-opened allowing the flow of fluid in said opposite direction and wherein said solenoid-operated valve means has a neutral blocking position, a first offset position where said first source of pressurized fluid is communicated with the rod end chamber of said first cylinder means and the head end chamber of said second cylinder means, and a second offset position where said check valve is pilot-opened by the fluid pressure from said first source of pressurized fluid and the rod end chamber of said first cylinder means and the head end chamber of said second cylinder means are connected with the drainage through said pilot-opened check valve.

4,505,173

THREE-KNIFE CUTTING MACHINE

Jürgen Hartlage, Langenhagen, Fed. Rep. of Germany, assignor to H. Wohlenberg KG GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Feb. 3, 1983, Ser. No. 463,395
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3204280; Jan. 27, 1983, 3302946
Int. Cl.³ B26D 7/06, 7/02, 1/03
U.S. Cl. 83—112 5 Claims



1. In a three knife cutting machine for stacked paper includ-

ing a conveying means provided with dogs to push paper into a transfer station and pushers moving back and forth in the direction of movement of the conveyor to deliver paper from the transfer station to a position against back stops in a cutting station in which side cuts are made by side knives and a head cut is made by a head knife and including means for removing paper from the cutting station, the improvement comprising:

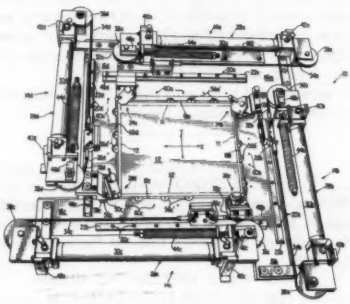
first stops including back stops (13–14) and side stops (12–15) at right angles to said back stops, the first stops being moveable in machine tempo back and forth between a transfer station (9) and a cutting station (18), second stops (24–25) moveable back and forth in the direction of travel of the conveyor between the cutting station (18) and a conveyor (27) for cut product, said first stops and said second stops being moveable perpendicular to the direction of travel of the conveyor.

4,505,174

AUTOMATIC MAT CUTTING APPARATUS

Charles H. Carithers, Jr., 1520 Edgewood St., Clinton, Miss. 39056

Filed Nov. 2, 1983, Ser. No. 547,953
Int. Cl.³ B26F *1/38*; B26D *3/00*
U.S. Cl. 83—455 **16 Claims**



1. An automatic mat cutting apparatus for simultaneously cutting a rectangular opening in a rectangular mat, the mat having mutually perpendicular X and Y reference axes which bisect the opening, the opening being defined by peripheral lines X1, X2, Y1, and Y2 with lines X1 and X2 parallel to the X axis and with lines Y1 and Y2 parallel to the Y axis, said mat cutting apparatus comprising:

a planar base upon which the mat rests;

an X0 guide means for positioning one outer side of the mat relative to said base, said X0 guide means defining a line parallel to the X axis and raised above said base and upon which one outer side of the mat rests;

a Y0 guide means for positioning an adjacent outer side of the mat relative to said base, said Y0 guide means defining a line parallel to the Y axis and raised above said base and upon which the adjacent side of the mat rests, the lines of said X0 and Y0 guide means having adjacent ends forming a corner;

X1, X2, Y1, and Y2 mat cutters;

X1, X2, Y1, and Y2 cutter mounting means for mounting respective X1, X2, Y1, and Y2 mat cutters for movement along respective lines X1, X2, Y1, and Y2 and above said base;

X1, X2, Y1, and Y2 cutter moving means for reciprocally moving respective said X1, X2, Y1, and Y2 cutters along respective said X1, X2, Y1, and Y2 mounting means; and

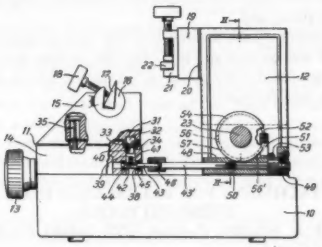
a control means for controlling the actuation of said X1, X2, Y1, and Y2 moving means so as to prevent said X1, X2, Y1, and Y2 cutters from contacting an adjacent cutter and for controlling the travel of said X1, X2, Y1, and Y2 cutters so that a desired length of cut is made along each line X1, X2, Y1, and Y2 by respective said X1, X2, Y1 and Y2 cutters and so that the adjacent ends of the cuts intersect one another.

4,505,175

MICROTOME

Artur Reichel, Wetzlar, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jan. 6, 1984, Ser. No. 568,884
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301921
Int. Cl.³ G01N *1/06*
U.S. Cl. 83—703 **9 Claims**



1. A microtome, comprising:

a blade;

a blade holder carrying said blade;

a blade slide, said blade holder being displaceably mounted on said blade slide;

means for moving said blade holder horizontally on said blade slide;

a specimen slide;

means for moving said specimen slide periodically toward said blade and away from said blade; and

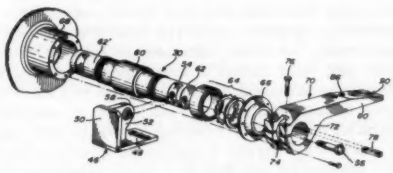
means drivingly connected with said specimen slide moving means for rotating said blade holder vertically around an axis which forms an accute angle with the cutting edge of said blade independently of said blade slide moving means.

4,505,176

BANDMILL MECHANISM

Gerald Hamel, St-Ephrem, Canada, assignor to Industries P. H. L., Inc., St-Ephrem, Canada

Filed Sep. 24, 1982, Ser. No. 423,023
Int. Cl.³ B27B *13/08*
U.S. Cl. 83—808 **5 Claims**



1. In a bandmill having a frame respectively supporting first and second arbor-supported wheels carrying and driving an endless saw, a mechanism adapted to move said first wheel relative to the second wheel in a plane including said wheels to thereby accommodate fluctuations resulting from saw-loading conditions, said mechanism comprising:

(a) a post having one end slidably received within said column;

(b) a plate fixed to the opposite end of said post outside said column;

(c) an arbor support fixedly mounted to said plate and having a hinge portion with a pivotal axis; the arbor of said first wheel including a central section adapted to receive said first wheel for rotation about a first axis and an end section coaxial with said central section; said hinge portion of said arbor support projecting within said end section of said arbor to a point such that said pivotal axis extends within said arbor but eccentric to said first axis; said end section having a recess to receive said hinge portion therein and being so shaped as to allow pivotal movement of said arbor about said pivotal axis;

(d) a tension arm having a first portion fixedly attached to said arbor and a second portion extending lengthwise over said plate; and

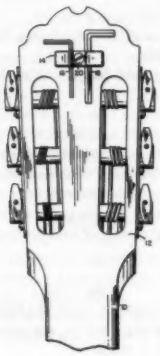
(e) resilient means located between said second portion of said tension arm and said plate for causing pivotal movement of said arbor about said eccentric axis to accommodate said fluctuations.

4,505,177

ATTACHMENT FOR RELEASABLY HOLDING STEMMED TOOLS

Helmut F. K. Schaller, Postfach 1225, D-8501 Feucht 1, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,209
Int. Cl.[3] G10D *3/00*
U.S. Cl. 84—329 **9 Claims**



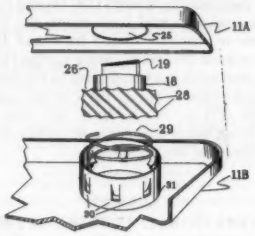
1. A device for attachment to a musical instrument or other mechanism for use in holding one or more stemmed tools used in servicing the mechanism, said device comprising a main body having a generally planar rear face for engagement with a conforminig face of the mechanism to which it is to be attached, said body having a screw aperture passing therethrough generally perpendicular to said rear face for receiving a screw to fasten said body to a mechanism, at least one anti-rotation lug on said body projecting rearwardly from said rear face along an axis parallel to and spaced from the axis of said screw aperture for reception by a conforming recess in said mechanism face to prevent rotation of said body about the axis of said screw aperture after said body is fastened to said mechanism by a screw inserted through said screw aperture, said body also having a tool receiving aperture passing therethrough along an axis located in a plane perpendicular to said screw aperture axis and spaced from said screw aperture axis, and means carried by said body for frictionally engaging the stem of a tool inserted in said tool aperture so as to releasably hold such tool in said body.

4,505,178

CHORD HAND CALLUS EXERCISER

John W. Redman, 7 Jean Dr., Old Lyme, Conn. 06371

Filed Sep. 29, 1982, Ser. No. 426,675
Int. Cl.[3] G09B *15/06*
U.S. Cl. 84—465 **6 Claims**



1. A device for exercising finger muscles and building finger tip calluses comprising:

edge means for stimulating callus building in a portion of skin repeatedly pressed against said edge means;

resistance means movable between two positions and having a bias toward one of said two positions for mounting said edge means and providing a muscle exercise function to said device; and,

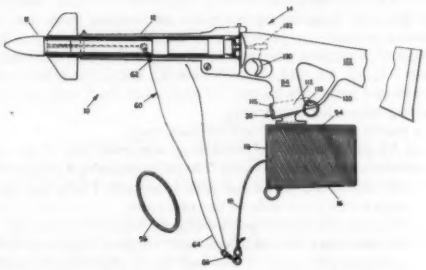
body means sized to fit into the palm of a human hand for mounting said resistance means.

4,505,179

LINE THROWING DEVICE

Steve Nelson; Frank Reynolds, both of Grand Rapids, Mich.; George E. Roos, Burns Flat, Okla., and John Ball, Conklin, Mich., assignors to Walker Limited Partnership, Comstock Park, Mich.

Filed Aug. 2, 1982, Ser. No. 404,546
Int. Cl.[3] F42B *13/56;* **F41F** *1/04*
U.S. Cl. 89—1 G **16 Claims**



1. A line throwing device adapted to be launched from a tubular launching device such as a riot gun comprising:

a projectile including an elongated body shaped to fit in the tubular launching device and a fin assembly, including outwardly extending stabilizing fins, slidably mounted on the body for axial movement along the body, the fin assembly sliding forwardly to permit the rear end of the body to be positioned in the tubular launching device and sliding rearwardly to a flight stabilizing position as the projectile is launched from the tubular launching device, the projectile body comprising two interfitting tubes, an inner tube being mounted at a forward end of an outer tube and extending only a part of the way toward the rear end of the outer tube;

rocket engine means mounted at the rear end of the projec-

tile for propelling the projectile, the rocket engine and interfitting tubes being formed such that the rocket engine fits into the outer tube but not into the inner tube, the rearmost end of the inner tube serving as a stop to limit inward movement of the rocket engine into the body and to maintain the rocket engine at the rear of the projectile;

ignition means mounted at the rear end of the rocket engine for igniting the rocket engine; and,

a line having one end that is carried by the projectile from the launching device to the projectile target area for rescue purposes or the like.

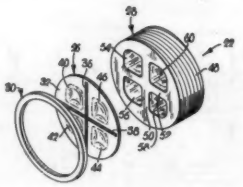
4,505,180
HIGH REVERSE PRESSURE RESISTANT LOW FORWARD BURST PRESSURE RUPTURE DISC ASSEMBLY

James O. Hinrichs, Odessa, Mo., assignor to Fike Metal Products Corporation, Blue Springs, Mo.

Filed Nov. 18, 1983, Ser. No. 553,258

Int. Cl.³ F41F *3/04*; F16K *17/40*; B65B *25/00*

U.S. Cl. 89—8 **7 Claims**



1. A rupture disc assembly, comprising:

a frangible disc presenting a low pressure face, an opposed high pressure face, and scoring on said high pressure face disposed at least partially about a rupture region for the disc; and

a backing member adjacent said low pressure face, including:

web means in substantial alignment with said scoring and in close proximity to said low pressure face for preventing rupturing of said disc under the influence of relatively high burst pressures directed against said high pressure face; and

structure defining an opening through said backing member for exposing an area on said low pressure face corresponding to said rupture region to burst pressures, and for rupturing of said disc along said scoring under the influence of relatively low burst pressures directed against said low pressure face.

4,505,181
STEPWISE DOUBLE-CARTRIDGE-ALTERNATE FEEDER FOR AN AUTOMATIC WEAPON HAVING A STRAIGHT BREECH OPERATION

Bernhard Schneider, Niederkruechten, and Horst Menges, Ratingen, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,196

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211132

Int. Cl.³ F41D *10/32*

U.S. Cl. 89—33.04 **6 Claims**

1. In an improved step-wise actuated double-cartridge feeder for an automatic weapon, in particular a machine cannon having a linearly operating breech block and a left and right sprocket wheel transport shaft operatively mounted in said feeder symmetrically with respect to the longitudinal axis of the weapon, wherein each transport shaft coacts with corresponding holding coupling means and each is operatively mounted in a housing which includes left and right feed channels, said transport shafts being selectively drivable in mutually opposite directions, alternate driving means operatively mounted in said housing for axially slidably displacing said holding coupling means, a control element is transversely pivotally mounted relative to the longitudinal axis of the weapon between said transport shafts and is adapted to position a cartridge transported by a driven sprocket wheel transport shaft in a predetermined manner into operative coaction with the linearly operating breech block for the purpose of being transported into the loading chamber in the gun barrel of the automatic weapon, the improvement comprising

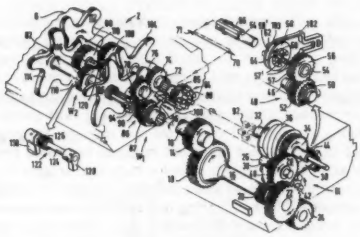
(a) means for stepwise driving a preselected one of said left and right transport shafts which include a globoidal worm gear;

(b) an external drive having an actuating element adapted to be uniformly driven thereby, said actuating element being positively connected to said globoidal worm gear;

(c) said globoidal worm gear being adapted to directly drive a first shaft operatively mounted in said feeder, said first shaft coaxially supporting a first gear wheel;

(d) a second shaft is operatively mounted in said feeder parallel to said first shaft, said second shaft coaxially supporting a second gear wheel which meshes with said first gear wheel, said first shaft being adapted to drivingly coact with said right transport shaft and said second shaft being adapted to drivingly coact with said left transport shaft;

(e) first alternate driving means being longitudinally slidably mounted in said feeder parallelly to the longitudinal axis of said weapon, said first alternate driving means including a



switching fork which is adapted to selectively couple said first alternate driving means to said globoidal worm gear;

(f) each holding coupling means coacting with the corresponding transport shaft comprises a first coupling half and a second coupling half which is fixed to the housing, whereby when both halves are positively coupled any rotation of the corresponding transport shaft is prevented;

(g) a switching hub operatively coacting with a coupling half of each coupling means;

(h) each switching hub includes form locking means adapted to coact with a corresponding transport shaft and is axially slidably displaceable relative thereto; each switching hub including a gear ring which is adapted to respectively mesh with said first and second gear wheel and a first switching fork operatively connected to both switching hubs;

(i) said first switching fork being adapted to be selectively moved to a first position in which said gear rings are respectively moved into meshing and driving engagement with said first and second gear wheels and said first coupling half is moved out of engagement with said second coupling half and to a second position in which said gear rings are respectively moved out of meshing and driving engagement with said first and second gear wheels and said first coupling half engages said second coupling half; and

(j) including cartridge inserting means operatively mounted in said feeder and adapted to selectively coact with said left and right transport shafts and forming part of a second

alternate driving means of said feeder, whereby said second alternate driving means is adapted to selectively drivingly couple said cartridge inserting means to said left or said right transport shaft.

4,505,182

FIREARM TRIGGER MECHANISM

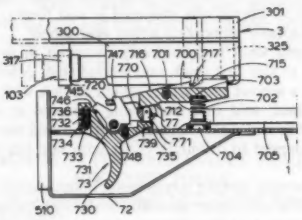
Leroy J. Sullivan, Singapore, Singapore, assignor to Chartered Industries of Singapore Private Ltd., Jurong Town, Singapore

Division of Ser. No. 520,117, Aug. 3, 1983, Pat. No. 4,475,437, which is a division of Ser. No. 280,740, Jul. 6, 1981, Pat. No. 4,416,186. This application Jun. 25, 1984, Ser. No. 624,032

Claims priority, application United Kingdom, Dec. 11, 1980, 8039739

Int. Cl.³ F41D *11/02*

U.S. Cl. 89—132 **3 Claims**



1. A gun including a trigger mechanism, a reciprocal bolt means, and a lug on said bolt means, said trigger mechanism comprising a pivotally mounted trigger, a pivotal sear connected to be rotated by said trigger, said sear having a rear part which is provided to selectively engage said lug, and a notch in an upper surface of the sear (adjacent said bolt means, said notch being arranged to cooperate and engage) for engaging with said lug when said lug is not engaged with said sear rear part, an axis of said trigger about which said trigger is rotatable, and mounted on said axis a member arranged to cooperate with a portion of the sear, spring bias means for said member so that said member moves with said trigger, (whereby) the trigger mechanism being arranged such that when the trigger is pulled to rotate the sear in the first direction out of engagement with said lug the member is initially prevented from moving with the trigger by the sear portion and when the lug is released by the sear the sear is further rotated in said first direction by the lug contacting the sear upper surface to free the member to move toward the trigger and under the sear portion, thereby preventing the sear from rotating in a direction counter to said first direction until the trigger is released.

4,505,183

GAS ACTUATED OPERATING MECHANISM FOR AUTOLOADING FIREARM

William H. Grehl, Wallingford, Conn., assignor to O. F. Mossberg & Sons, Inc., North Haven, Conn.

Filed Dec. 2, 1982, Ser. No. 446,396

Int. Cl.³ F41D *5/04*

U.S. Cl. 89—191.01 **18 Claims**

1. In an autoloading firearm having a receiver, a barrel secured to the receiver and having a bore, a breech bolt assembly supported within the receiver for movement between battery and retired positions, and gas actuated operating means for moving the bolt assembly in one direction from its battery position toward a retired position and including inertia means connected to the bolt assembly, the improvement wherein said inertia means comprises a plurality of elements including first and second inertia elements and a connecting element for connecting said inertia elements to said bolt assembly, said first and second inertia elements differing in weight from each other and from said bolt assembly, said elements being movable relative to each other and to said bolt assembly during movement of said bolt assembly from its battery position toward its retired position.

4,505,184

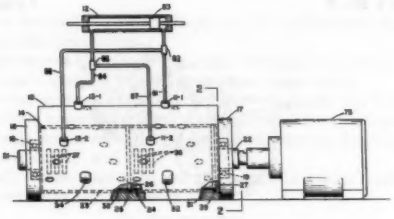
AIR DISTRIBUTOR FOR SEQUENTIALLY CONTROLLING AIR OPERATED APPARATUS

James S. McDonald, Bethany, Okla., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,798

Int. Cl.³ F15B *21/02*

U.S. Cl. 91—39 **15 Claims**



1. A pressurized air distributor, which comprises:

a housing having a cylindrical chamber therein;

a rotor mounted within said cylindrical chamber and having circumferential sections thereof spaced from the wall of said cylindrical chamber;

means on the rotor extending outwardly to engage said cylindrical wall to form said cylindrical chamber into an annular pressure chamber and an annular exhaust chamber which completely encircle the outer circumference of said rotor;

means for applying pressurized air to said pressure chamber;

means for exposing said exhaust chamber to the atmosphere;

first and second fittings mounted in said housing and having passages therethrough terminating in ports opening through said cylindrical wall into said cylindrical chamber;

said rotor having peripheral slots which are cut into but do not extend through rotor, said slots being movable with said rotor into register with said ports to provide a first passage for pressurized air from said pressure chamber through a registered slot and port and through a first fitting, while a second passage is established from said exhaust chamber through a registered slot and port and through a second fitting; and

means for rotating said rotor to move pairs of said peripheral slots into registration with said ports.

4,505,185

THROUGH-SHAFT ENERGY CONVERTER TRANSMISSION

Stephan J. Jacobs, Eureka, Calif., assignor to Power-Train, Inc., Eureka, Calif.

Continuation-in-part of Ser. No. 245,787, Mar. 20, 1981, abandoned. This application Apr. 12, 1982, Ser. No. 367,702

Int. Cl.³ F01B *13/04*; F16D *11/04, 13/40*

U.S. Cl. 91—491 **2 Claims**

1. A through-shaft energy converter transmission for use along a main drive shaft comprising:

a through-shaft energy converter including a housing;

a hollow coupling shaft mounted for rotation about its axis within said housing, adapted for passage of the main drive shaft therethrough and extending from a first end of said housing;

said through-shaft energy converter including:

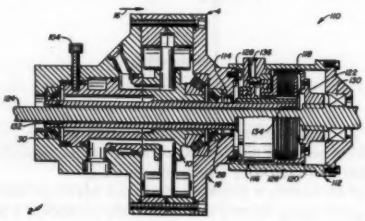
a rotor fixed to said coupling shaft for rotation therewith, said rotor having a plurality of radially extending pistons mounted within corresponding cylinders formed in said rotor;

a plurality of ports formed in said rotor fluidly connecting each said cylinder with a rotor valve surface of said rotor, said rotor valve surface being perpendicular to the axis of the main drive shaft;

a multiple-lobed track mounted to said housing and centered radially about said rotor;

means attached to the radially outermost portions of said pistons for moveably engaging said track;

fluid distributing means mounted in said housing for providing paths for higher and lower pressure fluids for intermittent communication with said ports through openings formed in a distributor valve surface of said fluid distributing means, said distributor valve surface



disposed perpendicular to said axis, said fluid distributing means including a first pathway communicating with first and second said openings in said distributor valve face and a second pathway communicating with third and fourth said openings in said distributor valve face, said first second, third and fourth openings evenly spaced about said axis with said first and second openings diametrically opposed and said third and fourth openings diametrically opposed; and

means for selectively orienting said openings and said track relative to one another about said axis thereby allowing the speed of operation and direction of rotation of said rotor to be continuously varied;

a through-shaft clutch mounted over a portion of said coupling shaft extending from said first end, said clutch including a first clutch element fixedly coupled to said coupling shaft and a second clutch element fixedly coupled to the main drive shaft;

means for positioning said main drive shaft within said coupling shaft; and

said clutch including means for selectively engaging said first and second clutch elements thereby operably coupling the main drive shaft to said energy converter.

4,505,186

LUBRICANT MONITORING SYSTEM

Hans Meier, Kollbrunn, and Werner Staheli, Neuenhof, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 18, 1983, Ser. No. 495,934

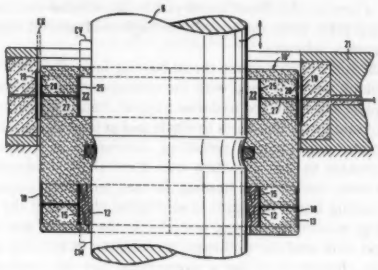
Claims priority, application Switzerland, May 18, 1982, 3076/82

Int. Cl.[3] **F01B** *25/26, 31/12;* **F04B** *49/00, 49/02*

U.S. Cl. 92—5 R **16 Claims**

1. In combination with a compressor having a cylinder block, a crankcase mounted on said block, a reciprocally mounted piston rod extending between said crankcase and said block, a lubricant wiper assembly about said rod between said crankcase and said block, and a seal about said piston rod at said block;

a lubricant monitoring system comprising at least one element mounted on said piston rod between said wiper



assembly and said seal for absorbing liquid lubricant from said rod and a first electrode mounted on said piston rod to form a measuring capacitor with said piston rod and wherein said element forms a dielectric for said measuring capacitor between said piston rod and said electrode.

4,505,187

RECIPROCATING PISTON ENGINE WITH SWASH PLATE MECHANISM

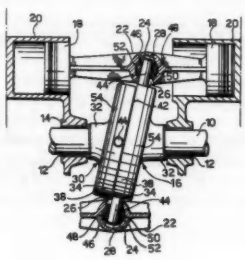
Antonio Burgio di Aragona, Moncalieri, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Apr. 5, 1982, Ser. No. 365,927

Claims priority, application Italy, Jan. 13, 1982, 67031 A/82

Int. Cl.[3] **F01B** *3/02, 31/10*

U.S. Cl. 92—31 **8 Claims**



1. In a reciprocating engine incorporating a drive shaft, at least one pair of opposed pistons with their axes parallel to that of the drive shaft, and a swash plate mechanism for converting the reciprocating straightline motion of the pistons into rotary motion of the drive shaft, the improvement wherein a respective rod rigidly interconnects the opposed pistons of the or each said pair of pistons, and said swash plate mechanism comprises:

a rotating containing structure which includes a pair of mutually-facing rotating swash plates, said rotating containing structure being coupled for rotation with said drive shaft and defining an annular cavity which is bounded by the two said rotating plates and has a bottom inclined relative to said drive shaft,

at least one oscillating plate housed in said annular cavity and mounted for rotation relative to said bottom of said cavity,

coupling means for pivotally connecting said at least one

oscillating plate with at least one respective said rod connecting a said pair of pistons, and

a hydrodynamic thrust bearing interposed between each of the two said rotating plates and the corresponding facing surface of said at least one oscillating plate for the purpose of bearing the thrust conveyed to said at least one oscillating plate from the pistons through said pivotal coupling means, wherein,

each said hydrodynamic thrust bearing incorporates a thrust block which is rigid with the corresponding said rotating plate and is formed to define a spiral channel in the surface of said block that faces towards said at least one oscillating plate, said channel spiralling outwardly in a direction counter to that in which said drive shaft is intended to rotate, each thrust bearing further including means for feeding liquid lubricant to said spiral channel of the bearing, in correspondence with the inmost turn of said channel with said spiral channel terminating in an outer annular channel to define a pressurized bed for bearing the pulsating loads imparted by said pistons to said plates.

4,505,188

PNEUMATIC ACTUATOR

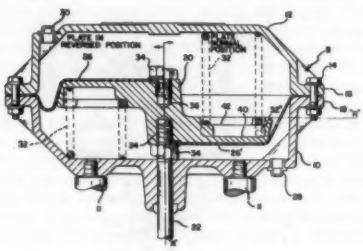
Willy V. D. Weydt, Toenisvorst; Ulrich Hannen, Willich, and Herbert Paetzel, Nettetal, all of Fed. Rep. of Germany, assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Jun. 16, 1983, Ser. No. 504,964

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224905

Int. Cl.³ F01B *19/02*; F16F *1/06*

U.S. Cl. 92—94 **9 Claims**



7. A pneumatic positioner, comprising:

(a) a hollow casing defining a peripheral wall;

(b) a substantially circular membrane plate defining a center and disposed within said casing so as to be free to move between a first position and a second position, said membrane plate defining two supporting surfaces which are radially disposed from said center and axially spaced from one another and from a reference plane which is perpendicular to the direction of movement of said membrane plate;

(c) a flexible diaphragm disposed between said peripheral wall of said casing and said membrane plate so as to form a pressure seal between the membrane plate and the casing while freeing the membrane plate to move within the casing;

(d) a gas connection carried by said casing and disposed on one side of said membrane plate; and

(e) removable biasing means, disposed between one of the two surfaces of said membrane plate and said casing.

4,505,189

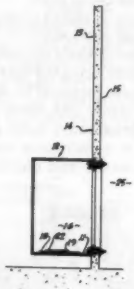
VANDAL-RESISTANT AND TAMPER-PROOF PLENUM OR VACUUM CHAMBER SECURITY AIR FLOW ADJUSTMENT DEVICE

Earl L. Morris, La Habra Hts., and V. Walter Hafner, Whittier, both of Calif., assignors to Acorn Engineering Company, Industry, Calif.

Filed Jan. 5, 1983, Ser. No. 455,752

Int. Cl.³ F24F *7/00*

U.S. Cl. 98—40.19 **9 Claims**



1. A vandal-resistant and tamper-proof plenum or vacuum chamber security air flow adjustment device, installed in the cabinet of a plumbing fixture, comprising:

a grille having a plurality of spaced openings therein, said grille being formed in a wall of the cabinet of a plumbing fixture and having a room-directed surface and a back surface on the opposite side thereof, the back side of said grille being inaccessible from the room but accessible from outside the room;

a damper member having an interior-facing surface and a mating surface which is slidingly mounted against the back surface of the grille, said damper member having two parallel sides, said damper member having a plurality of openings each opening matching in location an opening in said grille, said damper member being held along said two parallel sides by a pair of side brackets positioned beyond the extremity of said plurality of openings in said damper member and being slidingly adjustable so that the amount of free space which is permitted to pass through the grille varies as the damper member is slidingly adjusted; and

tightening means held by at least one of said brackets and said tightening means being positioned so that it abuts a surface of said damper whereby when said tightening means is tightened, the damper is held in a fixed position.

4,505,190

PORTABLE MAINTENANCE EXHAUST HOOD

Carl M. Fink, West Simsbury, and Edward C. Holman, Simsbury, both of Conn., assignors to Nuclear & Environmental Protection, Inc., Hartford, Conn.

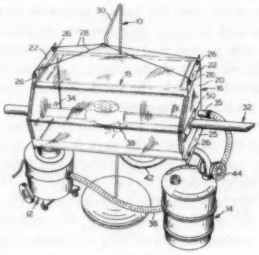
Filed Apr. 19, 1982, Ser. No. 369,502

Int. Cl.³ F24F *11/00*

U.S. Cl. 98—115.1 **12 Claims**

1. A portable exhaust hood for isolating a conduit section for maintenance and repair, including: an enclosure comprised of interconnected top, bottom, front, rear and end walls, at least said front wall being fabricated from a flexible transparent material and having a generally transversely extending free edge portion adjacent one of said bottom and top walls, said front wall being joined adjacent the other of said top and bottom walls, and being displaceable from a closed position with said edge portion disposed along said one wall, to an at least partially open position spaced therefrom, a hand access and air ingress opening into said enclosure thereby being de-

fined; means for securing said front wall in said open and closed positions; means providing passages from an edge of at least one of said walls for permitting the insertion of a section of an intact conduit into said enclosure for extension therethrough; at least one opening at a point remote from said ingress opening for egress of air from said enclosure; and means for supporting said hood in an operative position about the conduit, said securing means comprising a member extending continuously along the forward edge margins of each of said end walls, permitting securement of said free edge portion at substantially any position along the length of said member to vary the area of said ingress opening comprising a two-part hook and loop-type fastener, one part of said fastener providing said continuously extending members and the other part thereof being disposed on the facing surface of said front wall along the corresponding margins thereof.

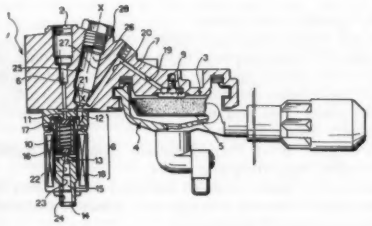


4,505,191

DISPENSING UNIT FOR ESPRESSO COFFEE MACHINES

Walter G. Longo, Desio, Italy, assignor to Nuova Faema S.p.A., Milan, Italy

Filed Apr. 9, 1984, Ser. No. 598,163
Claims priority, application Italy, Apr. 14, 1983, 20587 A/83
Int. Cl.[3] A47J *31/24*
U.S. Cl. 99—300 **7 Claims**



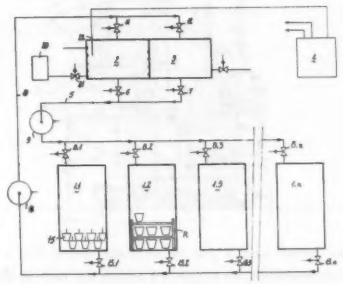
1. A dispensing unit for espresso coffee machines, of the type having a hot water inlet, a housing, a duct extending between the inlet and the housing, a removable filter holder inserted in the housing, and on-off hot water valve means located along said duct, wherein it duct.

4,505,192

INSTALLATION FOR COOKING, DEFROSTING AND COOLING OF FOOD PRODUCTS AND IN PARTICULAR HAMS

Claude Dréano, Rte. de Perhan, 56490 Guilliers, France

Filed Jun. 17, 1982, Ser. No. 389,445
Claims priority, application France, Jul. 8, 1981, 81 13922
Int. Cl.[3] A47J *27/20*
U.S. Cl. 99—330 **12 Claims**



1. Apparatus for cooking, heating, defrosting or cooling food products through a transfer of heat via a heat carrying fluid means which is associated with containers for the food products, said apparatus comprising means for bringing the heat carrying fluid into contact with the food products and containers for said food products during a relatively short period of time, then removing said fluid for a relatively long period of time, means for repeating a cycle of so bringing and removing said heat carrying fluid a certain number of times until a desired temperature appears at the center of the food product, means for controlling the introduction temperature of the heat carrying fluid to be slightly higher for heating or slightly colder for cooling relative to said desired temperature at the center of the food products, a number of thermally isolated enclosures containing a plurality of filled containers, a fluid heating station, a network of conducts for said heat carrying fluid extending between the enclosures and the heating station, pumping means and valve means in the network of conducts to selectively fill one enclosure with heat carrying fluid from the heating station, or to empty one of said enclosures into the heating station and control means for controlling the pumping means and valve means.

4,505,193

INDUSTRIAL DEEP-FRYER

René G. Mariotti, St. Cloud, France, assignor to Friteco, Inc., Oakton, Va.

Continuation of Ser. No. 356,809, Mar. 10, 1982, abandoned.
This application Jun. 22, 1984, Ser. No. 623,347
Claims priority, application France, Mar. 13, 1981, 81 05027
Int. Cl.[3] A47J *37/12*
U.S. Cl. 99—330 **16 Claims**

1. A self-contained deep-fryer for frying food portions to be consumed after frying in oil comprising:

an oil reservoir having an oil discharge opening and an oil readmission opening, and valve means to permit flow of oil through said readmission opening in response to a negative pressure in said reservoir,

a deep fry pan having an oil supply opening and an oil removal opening;

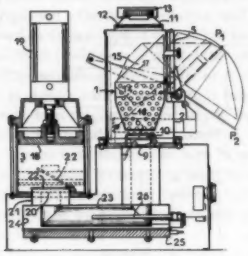
valving means to permit flow of oil through said supply opening in response to positive pressure outside said pan;

a first duct connecting said discharge opening and said supply opening;

heating means associated with said first duct for producing in said first duct a buffer of heated oil;

a second duct connecting said oil removal opening and said oil readmission opening;

piston means in said oil reservoir displaceable in a first direction to create a positive pressure outside said pan to thereby supply oil from said reservoir to said first duct and said buffer of heated oil in said first duct to said pan to fry



food therein without supplying additional heat to the oil in said pan, and displaceable in a second direction to create a negative pressure in said reservoir to return used oil from said pan to said reservoir via said second duct without mixing with the oil in said first duct; and

a filter in the oil path between said oil removal opening and said oil supply opening to filter used oil prior to the introduction thereof into the deep fry pan.

4,505,194

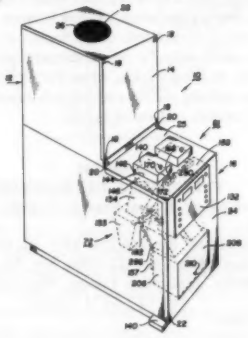
AUTOMATIC FOOD FRYING AND DISPENSING APPARATUS

Charles D. Bishop, 7729 Blossom La., Dallas, Tex. 75227; Joe R. Powell, 4617 Cliffwood, Garland, Tex. 75043; Kenneth H. Stamps, 1825 Glouchester, Garland, Tex. 75050, and Clifford A. Watson, 2822 Glenbrook, Garland, Tex. 75041

Filed Sep. 9, 1983, Ser. No. 530,013

Int. Cl.³ A47J *37/12*

U.S. Cl. 99—336 **20 Claims**



1. Automatic food frying and dispensing apparatus, said apparatus comprising:

a cabinet adapted to be supported at a suitable working height and having a predetermined number of panels, at least one of said panels being configured to allow access to the interior of said cabinet;

a container positioned within said cabinet for holding a supply of cooking oil;

means for maintaining the temperature of said cooking oil sufficiently high for cooking successive batches of food products;

means positioned within the cabinet for supporting the food product;

means for an operator to manually select a length of time for the food product to be cooked;

means for allowing the food product to be manually deposited by said operator into said means for supporting, said means for allowing including a lid which is movably mounted to a predetermined one of said panels of said cabinet with said lid being movable between a closed position and an open position, an aperture formed in said one of said panels and positioned in operative alignment with said lid and a chute which is operatively positioned in said cabinet to guide the food product from said aperture to said means for supporting;

means for automatically lowering the means for supporting the food product into the supply of cooking oil to a cook position upon the manual selection of the length of time for the food product to be cooked;

means for determining the termination of the selected length of time for the food product to be cooked;

means for automatically raising the means for supporting the food product to a discharge position upon the termination of the length of time manually selected by said operator for the food product to be cooked;

a food collection station positioned in a predetermined portion of said cabinet and capable of supporting a food container placed therein by said operator; and

means for guiding the food product from the means for supporting to said food container positioned in said food collection station by said operator.

4,505,195

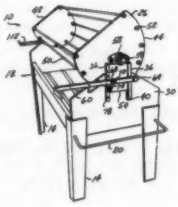
ROTISSERIE

John H. Waltman, 3336 Bald Mountain Rd., Pontiac, Mich. 48057

Filed Sep. 12, 1983, Ser. No. 531,031

Int. Cl.³ A47J *37/04*

U.S. Cl. 99—427 **7 Claims**



1. A rotisserie comprising:

first and second spaced supporting frames;

a cradle for supporting food to be cooked, said cradle having first and second opposite end plates connected together and shaft means extending longitudinally outwardly from said plates, said end plates each having a plurality of radially disposed slots;

shaft support means carried by said supporting frames for rotatably supporting said shafts;

a first control plate rotatably mounted on the shaft means associated with said first end plate between said first end plate and one of said frames;

a second control plate rotatably mounted on said shaft means associated with said second end plate between said first end plate and the other of said frames, said first and second control plates each having a plurality of spiral-shaped slots;

a plurality of longitudinally disposed clamping rods, each rod extending through one radial slot in each end plate

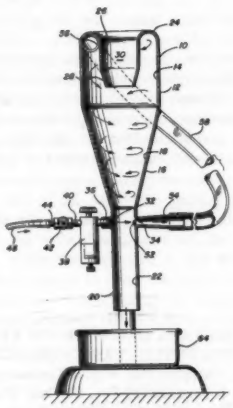
and one spiral slot in each control plate and movable within said slots as said plates are rotated with respect to each other such that the radial and angular position of said clamping rods with respect to the axis of rotation of each of said shafts may be selectively and independently varied across the length of the cradle.

4,505,196

SONIC SEED DEHULLING SYSTEM

Victor A. Beisel, Rte. 1, Box 26, Fargo, Okla. 73840

Filed Mar. 28, 1984, Ser. No. 594,378
Int. Cl.³ B02B *3/00*
U.S. Cl. 99—519 **8 Claims**



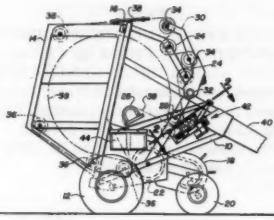
1. A seed dehuller including an upper upright cylindrical chamber, a central inverted frusto-conical chamber including major and minor diameter upper and lower ends and a lower depending cylindrical passage, the lower end of said upper chamber merging downwardly into the upper major diameter end of said inverted frusto-conical chamber, said minor diameter lower end merging downwardly into said passage, said passage being of smaller diameter than the diameter of said cylindrical chamber, an annular top wall closing the outer periphery of the upper end of the cylindrical chamber and including an inner periphery of smaller diameter than the diameter of said cylindrical chamber, a tubular votrex finder opening and extending downwardly into said cylindrical chamber from the inner periphery of said top wall, said cylindrical passage including a small diameter generally radially inwardly opening compressed air inlet intermediate the upper and lower ends of said passage and a lateral airflow outlet of greater cross-sectional area than said inlet opening generally radially outwardly of said cylindrical passage substantially diametrically opposite said inlet, said cylindrical chamber including an upper substantially tangential air inlet, and passage means communicating said lateral airflow outlet with said tangential inlet, said small diameter compressed air inlet including means adapted for connection with a variable pressure source of air under pressure.

4,505,197

TWINE CUT AND CLAMP MECHANISM FOR A ROLL BALING MACHINE

Paul S. Shenberger, Wyomissing Hills; James D. Walker, Lancaster, and Willis R. Campbell, Ephrata, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 16, 1984, Ser. No. 600,745
Int. Cl.³ B65B *13/18*
U.S. Cl. 100—5 **5 Claims**



1. In a roll baling machine having a base frame, means for wrapping a roll bale with twine, and a mechanism to cut and clamp said twine, said mechanism comprising:

first and second arms each having one edge adapted for cutting twine and another edge adapted for clamping twine;

first and second spur gears connected to said first and second arms, respectively; and

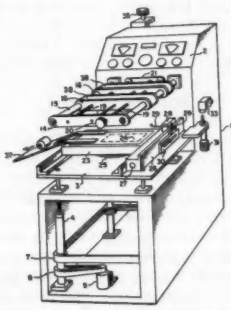
said first and second spur gears being in intermeshing engagement with each other.

4,505,198

APPARATUS AND METHOD FOR APPLYING PRINTED MATERIAL TO A CYLINDRICAL OBJECT

Richard D. Dee, 921 W. Macada Rd., Bethlehem, Pa. 18017; Louis A. DiGiacomo, 600 Orchid Cir., Emmaus, Pa. 18149, and Geza Tomosy, 626 Hillview Rd., Allentown, Pa. 18103

Continuation-in-part of Ser. No. 230,631, Feb. 2, 1981, abandoned. This application Sep. 27, 1983, Ser. No. 536,286
Int. Cl.³ B41F *17/08*
U.S. Cl. 101—40 **22 Claims**



1. An apparatus for transferring a pattern to arcuate surface portions of a cylindrical object which comprises:

(a) a screen containing the pattern to be transferred to the cylindrical object;

(b) a non-absorbent support device, having a leading end and a trailing end, positioned adjacent to one side of the screen, wherein said screen and support device remain stationary;

(c) a means for delivering paint to the leading end of said support device; and

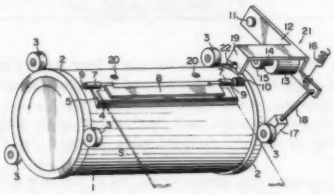
(d) a chuckless advancing means for receiving and continuously rolling the cylindrical object across the surface of said screen opposite the support device in a direction from the leading to the trailing end of said support device, such that the arcuate surface portions of the cylindrical object force the paint to advance across the support device and through the screen and onto the arcuate surface of the cylindrical object as said cylindrical object is advanced through and subsequently discharged from the apparatus.

4,505,199

SYSTEM FOR RETAINING STENCIL PRINTING MASTER ON PRINTING DRUM BY CLAMP STRIP HINGED ALONG DRUM GENERATOR

Takanori Hasegawa, and Takanobu Shimada, both of Tokyo, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Jul. 29, 1983, Ser. No. 518,422
Claims priority, application Japan, Nov. 26, 1982, 57-207217
Int. Cl.³ B85C *17/08*
U.S. Cl. 101—127.1 **6 Claims**



1. A system for retaining a leading edge of a stencil master to a cylindrical printing drum of a stencil printing device, said printing drum being mounted to be rotatable around its central axis, comprising:

a magnet strip carried by said printing drum to extend substantially along an outer surface portion thereof and parallel with said central axis;

a clamp strip made of a material which is magnetically attracted by said magnet strip, one edge of said clamp strip being hinged to said printing drum along a pivot line extending near one side of said magnet strip substantially parallel with said central axis so that said clamp strip can be pivoted for substantially 180° between a first pivot position where it lies against and along said magnet strip so as to be held thereon by an attracting magnetic force and a second pivot position where it lies against an outer surface portion of said printing drum opposite to said magnet strip with respect to said pivot line so as to be substantially free from the attracting magnetic force of said magnet strip;

a permanent magnet mounted at a circumferentially spaced surface portion of said printing drum for stably holding said clamp strip at said second pivot position; and

a means for selectively driving said clamp strip between said first and second pivot positions by overcoming the holding actions applied to said clamp strip by said magnet strip and said magnet for holding said clamp strip at said second pivot position said driving means comprising:

a first gear wheel coupled to said clamp strip with its central axis in alignment with said pivot line of said clamp strip so as to be rotatable with said clamp strip around said pivot line;

a second gear wheel which can mesh with said first gear wheel to drive said first gear wheel and

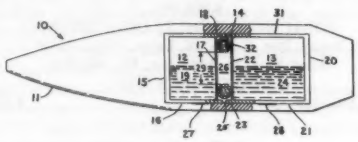
a means which supports said second gear wheel to be rotatable around its central axis and to be selectively movable between a first shift position where said second gear wheel meshes with said first gear wheel when said printing drum is in its certain predetermined rotational position and a second shift position where said second gear wheel is removed from said first gear wheel so as not to interfere with said first gear wheel when said printing drum is rotated around said central axis.

4,505,200

DYNAMIC SEAL

Clarence C. Bush, deceased, late of Bel Air, Md. (by Florence F. Bush, administratrix), assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 2, 1983, Ser. No. 463,185
Int. Cl.³ F42B *13/46*
U.S. Cl. 102—293 **9 Claims**



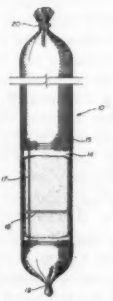
1. A dynamic seal for a projectile having an internal chamber for canisters of discrete liquids, and a circumferential gap between adjacent canisters thereof, comprising a ring member formed of an elastomeric material with an annular chamber positionable about said circumferential gap, and a deformable substance disposed in said annular chamber of said ring member.

4,505,201

IMPACT RESISTANT BAG WITH INCREASED CIRCUMFERENTIAL YARN STRENGTH

Wolfgang P. Abele, Stuttgart, Fed. Rep. of Germany, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 19, 1984, Ser. No. 572,730
Int. Cl.³ F42B *3/00*
U.S. Cl. 102—324 **15 Claims**



1. An impact resistant bag comprising a woven fabric having a plurality of longitudinal yarns; and a continuous circumferential yarn or yarns interwoven through said longitudinal yarns, the weave densities of said yarns being between 4 and 25 picks per inch; said circumferential and longitudinal yarns having a toughness ratio of between about 4.0/1.0 and about 1.67/1.0.

4,505,202

MULTI SOURCE CARTRIDGE FOR DISPERSING A RIOT CONTROL AGENT

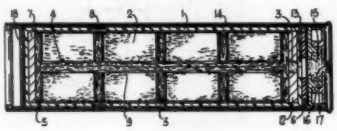
John Fidler, and John M. Green, both of Salisbury, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 15, 1980, Ser. No. 203,846

Claims priority, application United Kingdom, Oct. 31, 1979, 7937670

Int. Cl.³ F42B *4/00*

U.S. Cl. 102—357 3 Claims



1. A projectile comprising a cylindrical sabot which is split longitudinally into arc-shaped segments, means for hinging together the segments at the rear end of said sabot, locking means for locking the arc-shaped segments together in cylindrical sabot form, a plurality of annular riot control charges coaxially disposed within said sabot, each of said charges comprising a riot control agent, a sabot opening charge located between adjacent pairs of said riot control charges and within an axial channel passing through the riot control charges, said opening charge being of sufficient power to disengage said locking means and to open said sabot without disintegrating said riot control charges, and a pyrotechnic delay fuse located at the rear end of the sabot for igniting said sabot opening charge while the projectile is in flight, the launching of the projectile being operative to activate the pyrotechnic delay fuse which, while the projectile is still in flight, ignites said sabot opening charge to open the sabot by disengaging said locking means and forcing apart the hinged, arc-shaped segments, thereby releasing the riot control charges.

4,505,203

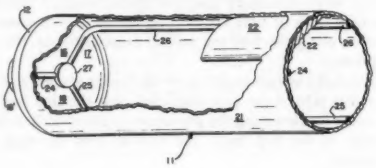
FRANGIBLE BALLAST

D. Ward Brady, New Brighton, and James F. Chapman, Waverly, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 4, 1983, Ser. No. 463,693

Int. Cl.³ F42B *25/20*

U.S. Cl. 102—382 2 Claims



1. In combination:

an elongated container comprising a plurality of explosively separable parts extending rearwardly from a closed forward end;

a load in the rearward end of said container;

and a frangible, unitary ballast member in said container between said closed end and said load, said container being separable by flexible linear shaped charges extending across said closed end, and said ballast member being weakened along lines adjacent to said charges.

4,505,204

DRIVE ELEMENT FOR A SUB-CALIBRE PROJECTILE

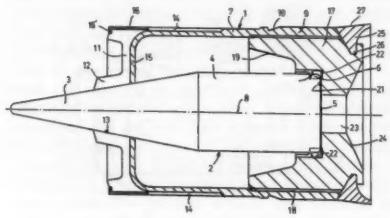
Arne Wikström, Skellefteå, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed May 17, 1983, Ser. No. 495,388

Claims priority, application Sweden, May 28, 1982, 8203313

Int. Cl.³ F42B *13/16*

U.S. Cl. 102—523 5 Claims



1. An improved drive element for a sub-calibre spinning projectile of the type having a conical nose section and a cylindrical main body, said drive element comprising:

a full-calibre, cylindrical guide sleeve having a longitudinal axis and a forward facing cup-formed front wall means extending transversely to said axis for increasing air flow forces acting on said drive element upon exit from a gun barrel, said front wall means comprising an axially extending opening for receiving the nose section of such a projectile; said guide sleeve further comprising a rearward facing hollow cylindrical wall means attached to said front wall for enclosing the cylindrical main body of such a projectile;

a plurality of circumferentially spaced slots running along a portion of the length of said cylindrical wall means and continuing across said front wall means to said opening, said slots extending only partially through the thickness of said cylindrical wall means and said front wall means to such a depth that a substantially uniform thickness remains in said front wall means and said cylindrical wall means at the bottoms of said slots, whereby air flow forces and centrifugal forces acting on said drive element after firing cause said front wall means and said cylindrical wall means to experience concentrated stress at said slots and to break into pieces to facilitate separation of such a projectile from said drive element;

a sabot member mounted within said cylindrical wall means of said guide sleeve, said sabot member comprising a cup-formed front surface having a central, rearwardly extending axial hollow for receiving the main body of such a projectile; and

locking means within said axial hollow for engaging the main body of such a projectile to secure such a projectile to said sabot member.

4,505,205

ENCLOSED FLOOR TRACK SYSTEM

Min N. Huang, Madison, and David L. Brethorst, Lodi, both of Wis., assignors to DEC International, Inc., Lodi, Wis.

Filed Sep. 30, 1982, Ser. No. 431,250

Int. Cl.³ B61B *13/00*

U.S. Cl. 104—139 12 Claims

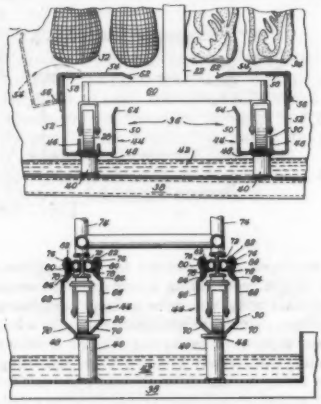
1. A protective enclosed track for movement therein of the support structure associated with a truck or the like, comprising an elongate leak proof enclosure including two opposing sides rigidly integral with a load bearing bottom surface onto which the support structure of said truck is movably engaged, a single top cover movable to allow access to the inside of said enclosure, and a longitudinal side slot in said enclosure for accommodating the support structure of said truck.

12. A floor track system for use in transporting wheeled

dolly-type food trucks into and out of a sanitary liquid treatment chamber, a track of said system comprising:

an elongate channel into which one or more of the wheels of said truck are guidably moved, said channel including a bottom and opposed inner and outer sidewalls extending upwardly above the wheels of said truck;

inflatable seal means attached along the edge of each upwardly extending sidewall and disposed so as to generally



overly the top of said channel and receive therebetween the axle structure of said wheel, whereby when each said seal is inflated and thereby expanded, each axle structure is enveloped thereby providing a liquid seal along the length of the track channel as well as around the axle structure; and

a plurality of support legs for supporting said track above a floor to thereby elevate said track above fluid flowing on said floor.

4,505,206

METHOD AND CIRCUIT ARRANGEMENT FOR OPTIMALLY CONTROLLING AN AIR GAP BETWEEN AN ELECTROMAGNETICALLY LEVITATED VEHICLE AND A RAIL

Eveline Gottzein, Oberpframmern; Rolf Keeve, Munich, and Michael Surauer, Chieming, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

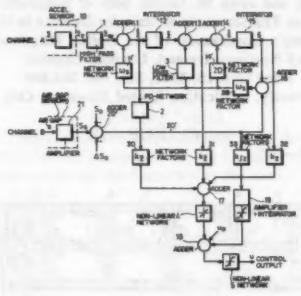
Filed Apr. 20, 1982, Ser. No. 370,166

Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3117971

Int. Cl.[3] **B61B** *13/08*

U.S. Cl. 104—284 **2 Claims**

1. A method for optimally controlling the adaptation of an air gap between a magnet of an electromagnetically levitated vehicle and a rail on which the vehicle is travelling, to unknown disturbances with the aid of a closed loop control circuit, comprising the following steps: supplying to said closed loop control circuit a weighted acceleration signal representing said unknown disturbance, providing said closed loop control circuit with non-linear circuit means (**4**, **5**) for limiting substantially those disturbances which occur for short time durations, but have high amplitudes, measuring an actual air gap representing signal value (S), forming a difference signal value (ΔS_o) between said actual air gap representing signal value and a rated air gap signal value (S_o), and supplying said difference signal value (ΔS_o) to a summing circuit (**20**) for increasing said rated air gap signal value (S_o) when said high amplitude disturbances occur, whereby said rated air gap value



(S_o) is continuously changed with reference to said actual air gap representing signal value (S).

4,505,207

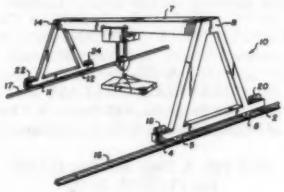
CRANE ANTI-SKEWING DEVICE

Stjepan Bagaric, North Vancouver, and Gunter Pietsch, Surrey, both of Canada, assignors to Heede International Ltd., Port Moody, Canada

Filed Oct. 20, 1980, Ser. No. 198,098

Int. Cl.[3] **B61D** *1/00, 15/00;* **B61F** *17/00*

U.S. Cl. 105—163 SK **8 Claims**



1. An anti-skewing device for a crane having a bridge with a set of wheels at first and second opposite ends thereof for traveling along the first and second parallel tracks, the device comprising:

a proximity switch mounted to the bridge spaced apart from a first side of the first track and near the first end of the crane for detecting the proximity of the switch to the first side of the first track and thereby any skewing of the crane;

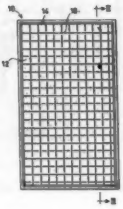
electrically activated means, mounted to and carried by the bridge and operably coupled to at least one of the wheels traveling along each of the first and second tracks, for applying a braking force to the wheels; and

circuit means, electrically connecting said proximity switch and said braking force applying means, for electrically actuating at least one of said braking force applying means in response to the proximity switch to slow said one end of the crane relative to the other end of the crane and thereby correct any skewing during movement of the crane.

4,505,208
PROTECTIVE FILLING, PARTICULARLY FOR SAFE WALLS

Ilan Goldman, 10 Bar-Eli St., Tel Aviv, Israel

Continuation of Ser. No. 302,757, Sep. 16, 1981, abandoned. This application Aug. 24, 1983, Ser. No. 526,495
Claims priority, application Israel, Sep. 17, 1980, 61054
Int. Cl.[3] E04B *2/08*
U.S. Cl. 109—85 11 Claims

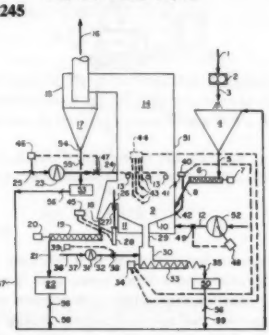


1. A torch and drill protective safe wall, comprising:
a heat conducting non-ferrous alloy forming the main structural component of said wall;
a cast steel alloy grill directly embedded in said heat conducting non-ferrous alloy and extending to the edges of said wall, said cast grill being of a type which will not become annealed when said grill is located in a cooling molten alloy used to form said main structural component of said wall.

4,505,209
UNFIRED DRYING AND SORTING APPARATUS FOR PREPARATION OF SOLID FUEL

Charles Strohmeyer, Jr., Gladwyne, Pa., assignor to Electrodyne Research Corporation, Gladwyne, Pa.

Continuation-in-part of Ser. No. 464,062, Feb. 3, 1983, Pat. No. 4,449,483. This application Mar. 30, 1984, Ser. No. 595,518
The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.
Int. Cl.[3] F23D *19/02*
U.S. Cl. 110—245 4 Claims



1. An unfired drying and sorting apparatus for preparation of solid fuel prior to firing in a combustion furnace incorporating:
a supply of sized moisture bearing solid fuel and inert material to be dried and sorted;
a vertical chamber;
a fluidized bed comprising a mixture of said sized particles of said solid fuel and inert material;
means for continuously adding a stream of said sized particles to said bed for drying and sorting;
a sorter at the base of said vertical chamber having a floor for supporting said fluidized bed within said vertical chamber;
ports in said floor;
means continuously furnishing unsaturated air/gas to said ports;
said ports adapted to discharge said unsaturated air/gas into said bed directionally and in a distributed pattern over said sorter floor fluidizing said mixture of sized particles of solid fuel and inert material and driving said mixture in a retraceable path around said floor of said bed, said unsaturated air/gas upflow through said bed vaporizing moisture borne by said particles and transporting said vapor in said air/gas stream exiting from said bed;
means for removal of said inert particles from said bed through a first collection point including a trough-like depression in said bed floor wherein means are provided for directing a portion of said directional fluidizing air toward said first collection point at the bottom of said trough and adapted for transporting a heavier/more dense non-combustible portion of said solid material through said trough in a direction transverse to the general direction of particle flotation above said trough and toward said first collection point;
said trough-like depression being located downstream of the point where said moisture bearing sized solid particles are introduced to said bed;
means for segregating said solids directed to said first collection point adapted to pass said heavier/more dense solid materials through said first collection point and to reject lighter/less dense fuel portions of said particles to said bed upper portion;
a second collection point at said upper portion of said bed adapted for removing said lighter/less dense combustible portion of said solid material from said vertical chamber;
said means for adding a continuous supply of said sized particles to said bed and said first and second collection points being located with reference to said retraceable path in a manner to provide retention time for said particles in said bed and to cause particles from said point of entry to said bed in a fluidized state to flow to said second or third collection points selectively by virtue of particle density and over a period of time to facilitate sorting;
means located at the outlet of said vertical chamber for removal of air/gas and water vapor;
means connected to said outlet means adapted to separate solid particles entrained in said air/gas and water vapor stream; means for measurement of differential pressures across said bed at various elevations and adapted to determine bed height; and
means for injecting secondary air horizontally at the top elevation of said bed at varying elevations and adapted for selectively skimming fine solids from said top of said bed, entraining said fines in said outlet air/gas stream.

4,505,210
MULTIPLE HEARTH FURNACE CHAMBER

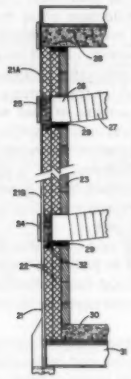
Jack K. Schuck, Wausau, and Neal J. Adams, Weston, both of Wis., assignors to Zimpro Inc., Rothschild, Wis.

Filed Apr. 13, 1984, Ser. No. 599,846
Int. Cl.[3] F23M *5/00*
U.S. Cl. 110—336 8 Claims

1. A multiple hearth furnace chamber, comprising:
a cylindrical metal shell, having its axis oriented vertically, having one or more buckstay bands horizontally encircling its exterior to absorb outward-directed radial forces, and having refractory roof and floor;
a plurality of upwardly-directed, refractory, temperature-expansible hearths spaced vertically within said shell, having openings for passage of combustibles, gases and ash therethrough, each hearth having its outer perimeter in the same horizontal plane as one of said buckstay bands;
spaces within said chamber between said hearths comprising hearth spaces;

plural rings of high strength castable refractory, each encircling the inside of said shell in the same horizontal plane as one of said buckstay bands;

a single row of skewback bricks encircling said perimeter of each of said hearths and abutting said refractory rings of high strength castable refractory, to direct forces generated by the weight and radial thermal expansion of said hearths through said refractory rings and said shell to said buckstay bands such that friction between said shell and said refractory rings and between said refractory rings and said skewback bricks support each hearth independently in a substantially unchanging horizontal plane;



furnace lining comprising panels of firebricks encircling and spaced from said inside of shell between adjacent hearths, resting on and supported by the skewback bricks immediately below each of said panels and separated from the skewback bricks immediately above each of said panels by an expansion joint;

said expansion joint comprising an insulating, compressible, refractory material to absorb vertical displacement of said panels of firebricks resulting from thermal expansion, without generating high stress on skewback bricks above each of said panels; and

thermal insulation filling said space between said firebrick panel lining and said metal shell.

4,505,211

METHOD FOR DRYING AQUEOUS, SOLID FUELS

Charles-Louis V. Lamare, Norrköping, Sweden, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed May 5, 1982, Ser. No. 375,756

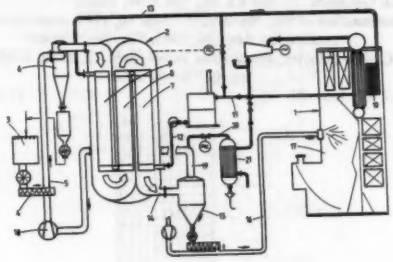
Claims priority, application Finland, Jun. 25, 1981, 811985

Int. Cl.³ F23G *5/02*

U.S. Cl. 110—346 **7 Claims**

1. A method for drying aqueous solid fuels comprising the steps of:

heating said fuel indirectly in a dryer by means of a medium heated in a boiler or the like, said medium being a liquid having a boiling temperature higher than water; and using steam formed in said dryer by the evaporation of moisture from said fuels to both heat said fuel in said dryer



and to pneumatically transport all of said fuel from said dryer.

4,505,212

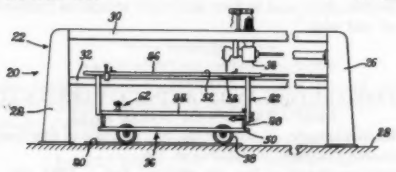
SHAPE FORMING AND QUILTING APPARATUS

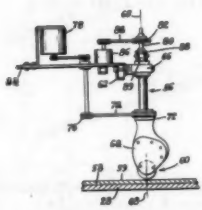
Michael Schwarzberger, Chicago, Ill., assignor to ABM Industries, Inc., Skokie, Ill.

Filed Jun. 1, 1983, Ser. No. 500,023

Int. Cl.³ D05B *11/00*

U.S. Cl. 112—118 **17 Claims**





1. Apparatus for incorporation in a machine having a tool head from operation on a work piece that is movable along both x and y axes, and operating components simultaneously movable along each said axis and correspondingly operable for moving the work piece along the axes respectively, including,

a drive unit having driving engagement with a stationary drive surface and movable about a vertical axis in all directions on that surface, the drive unit having driving connection with said operating components and operable for moving them in response to itself moving,

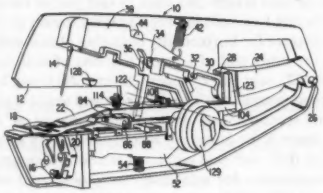
means for driving the drive unit, and

means for varying the direction of movement of the drive unit, during its movement, for correspondingly moving said operating components along the respective axes, and thereby moving the work piece correspondingly along both axes.

4,505,213
STITCH LENGTH CONTROL FOR HAND OPERABLE SEWING MACHINE

Karl H. Killinger, Dover, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Apr. 16, 1984, Ser. No. 600,929
Int. Cl.³ D05B 27/22, 27/04, 1/06, 97/02
U.S. Cl. 112—315 5 Claims

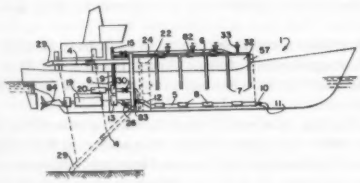


1. In a sewing machine, a sewing needle; a looper with a loop seizing point; a feed dog with a work engageable end portion and a rearward extension; means mounting the feed dog along the rearward extension for pivotal movement about mutually perpendicular axes; an adjustable stop engageable with the feed dog; a work supporting bed; a pressure plate for holding the work piece against the bed, said plate including one or more openings for the feed dog end portion to extend through and engage the work piece; a movable handle; mechanism responsive to the operation of the handle for moving the looper and needle into cooperative association for the formation of chain stitches, said mechanism including spring means which biases the handle to a hands off position and the feed dog into a position of engagement with the stop wherein the work engageable feed dog end portion is located over the work piece; means responsive to the operation of the handle for pivoting the feed dog from the stop engaging position about one of said axes to thereby move the work engageable end portion downwardly into engagement with the work piece, and for moving the feed dog about the other axis while engaged with the work piece to thereby move the work piece relative to the needle; and a stitch length control operably connected with the stop to enable an operator to position the stop and there predetermine the extent to which work is displaced by the feed dog during the movement thereof about said other axis.

4,505,214
DREDGED SOIL CONVEYING VESSEL

Johannes C. Tjebbes, and Tjako A. Wolters, both of Zeist, Netherlands, assignors to Ballast-Nedam Groep N.V., Amstelveen, Netherlands

Filed Jul. 9, 1980, Ser. No. 167,328
Claims priority, application European Pat. Off., Jul. 31, 1979, 79200428.5
Int. Cl.³ B63B 35/30
U.S. Cl. 114—29 8 Claims

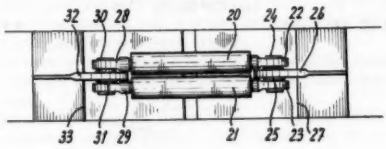


1. A dredged soil conveying vessel comprising a hold for receiving dredged soil, for example sand, said hold being enclosed between two pivotally interconnected ship's halves, each of which has floating power and which join one another along the outsides of their bottom rims in the closed state, thus bounding the hold, said ship's halves being pivotable about a horizontal longitudinal axis of the closed state into a discharging position, in which the hold is open on the bottom side and the cargo of dredged soil can be shed out of the hold past between the outsides of said two bottom rims, a discharge suction channel being arranged near the bottom of the hold and communicating with the hold through at least one opening that can be closed, said channel being connected with a slush outlet conduit, characterized in that a discharge suction channel is positioned within at least one ship's half at the inner side of a bottom rim and in that in the hold of the vessel a plurality of water supplies is directed along the walls, said two ship's halves having a pump with a prime mover, only one of the two ship's halves comprising a discharge suction channel and the compression side of the pump in one ship's half communicating through a flexible tubing with the suction side of the pump of the other ship's half, said compression side communicating with the slush outlet conduit.

4,505,215
SPLIT HOPPER VESSEL

Jan Stigter, Lekkerkerk, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed Apr. 5, 1983, Ser. No. 482,292
Claims priority, application Netherlands, Apr. 5, 1982, 8201436
Int. Cl.³ B63B 35/30
U.S. Cl. 114—29 3 Claims



1. In a split hopper vessel comprising two half hulls which are pivotably connected to each other by means of a pivot shaft which extends at a high level parallel to the longitudinal axis of the ship, spaced apart cylinder pairs disposed below said pivot shaft and extending transverse to said pivot shaft and interconnecting said half hulls, said cylinders having housings pivotally connected to one half hull of the ship and piston rods pivotally connected to the other half hull of the ship, conduit means interconnecting the rod sides of said each pair of cylinders and the piston sides of each pair of cylinders, and a remotely controllable locking valve which also functions as a safety valve and is disposed in said conduit means; the improvement comprising a common axle connected by cylindrical bearings to the rods of each cylinder pair, a common axle connected by cylindrical bearings to the housings of each cylinder pair, a self-adjusting bearing surrounding each axle between the cylindrical bearings on the axle, each said self-adjusting bearing being mounted on a respective hull half, said conduit means being rigid, said conduits for said rod sides being connected to one side of said locking and safety valve, and said conduit means for said piston sides being connected to the other side of said locking and safety valve.

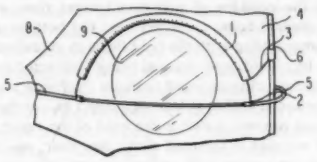
4,505,216
APPARATUS FOR PILOTING SAILBOARDS

Ramon H. Elorza, Rios Rosas 19, Madrid, Spain

Filed Mar. 30, 1983, Ser. No. 480,326
Claims priority, application Spain, Mar. 30, 1982, 264.239
Int. Cl.³ B63B 35/00
U.S. Cl. 114—39 4 Claims

1. In a sailboard having an upstanding mast and a wishbone boom surrounding the mast and extending a sail supported by

the mast; the improvement comprising an elongated flexible element secured at its two ends to one side of the wishbone mast for vertical swinging movement relative to the boom, said



element being curvilinear and of a length greater than the distance between its ends along the boom, and elastic means extending between the element and the boom and tending to swing the element to an inoperative raised position.

4,505,217

RIGID MARINE SAIL

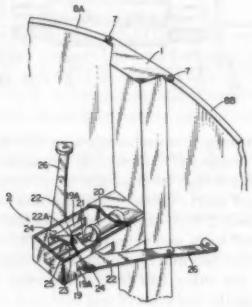
Yoichi Endo, Yokohama; Kazuo Nakanishi, Tokyo; Hideki Namura; Terukazu Doi, both of Yokohama; Katsunori Kusumoto, Yokosuka; Kazuyuki Shimizu, Fujisawa; Kazuhiko Yoshimi, Tokyo; Shigeru Nagai, and Shoichi Sato, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1983, Ser. No. 489,700

Claims priority, application Japan, May 14, 1982, 57-80207; Rep. of Korea, May 10, 1983, 83-1990

Int. Cl.[3] **B63H** *9/06*

U.S. Cl. 114—103 **6 Claims**



1. In a rigid marine sail which comprises:

a vertical mast secured onto the deck of a ship, said mast being rotatable around the vertical axis thereof; at least one pivot shaft provided substantially in parallel with said mast; a left sail portion and a right sail portion pivotally mounted substantially in parallel with said mast through said at least one pivot shaft, said left and right sail portions being arranged respectively on left and right sides of said mast; and at least one drive mechanism coupled to said sail portions and to said mast for symmetrically pivoting said left sail portion and said right sail portion relative to said mast around said at least one pivot shaft between a deployed position of said sail portions and a folded position of said sail portions;

the improvement wherein:

each of said at least one drive mechanism (**9**) comprises:

a set of a cylinder (**20**) and a piston rod (**21**) secured substantially horizontally to said mast (**1**);

a pair of L-shaped first levers (**22**), each of said pair of first levers (**22**) having two ends and having a respective substantially elliptical through-hole (**22A**) at an end thereof for horizontally engaging with an end of said piston rod (**21**) through said substantially elliptical through-hole (**22A**), said pair of first levers (**22**) being bilaterally arranged symmetrically relative to a vertical plane which passes through said vertical axis of said mast (**1**) and is parallel to the longitudinal direction of said ship, and means for pivotally mounting said pair of first levers (**22**) for symmetrical pivotable movement thereof relative to said vertical plane around respective fulcrums (**24**) thereof;

a pair of second levers (**26**), each of said pair of second levers (**26**) having two ends having engaging means at respective ends thereof for horizontally engaging at said ends thereof with the other end of a respective one of said pair of first levers (**22**), said pair of second levers (**26**) being bilaterally arranged symmetrically relative to said vertical plane, said pair of second levers (**26**) including means at the other ends thereof for engaging respectively with said left sail portion (**8A**) and said right sail portion (**8B**); and

actuataing means for selectively actuating said set of the cylinder (**20**) and the piston rod (**21**) to retract said piston rod (**21**) to cause said left and said right sail portions (**8A**, **8B**) to pivot about their respective pivotal mountings to said deployed position through said pair of first levers (**22**) and said pair of second levers (**26**), and for selectively actuating said set of the cylinder (**20**) and the piston rod (**21**) to extend said piston rod (**21**) to cause said left and said right sail portions (**8A**, **8B**) to pivot about their respective pivotal mountings to said folded position through said pair of first levers (**22**) and said pair of second levers (**26**).

4,505,218

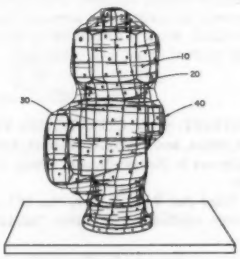
TAMPER-INDICATING SEAL

Sidney Fiarman, Port Jefferson; Michael F. Degen, Patchogue, and Henry F. Peters, Brookhaven, all of N.Y., assignors to United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 13, 1982, Ser. No. 408,091

Int. Cl.[3] **B65D** *85/02, 90/48*

U.S. Cl. 116—200 **12 Claims**



1. An apparatus for forming a tamper-indicating seal comprising:

(a) a first heat shrinkable tube sized to fit over an item to be sealed and capable of being shrunk to cling tightly to such item, said first tube having a first pattern of visible markings; and,

(b) a second, transparent heat shrinkable tube sized to fit over such item and said first tube after said first tube has been shrunk onto such item and randomly heated over its outer expanse, so as to be shrunk to cling tightly to said first tube and such item so as to form a seal, said second tube having a second pattern of markings that differs from said first pattern such that after said seal is formed the relationship between said first and second patterns produces an essentially unique random pattern that may be noted so that any attempt to remove and replace said seal

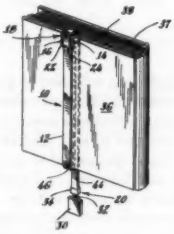
will produce a change in said unique random pattern, which change may be detected.

4,505,219

ADJUSTABLE BOOKMARK FOR PAPERBACK AND HARD COVER BOOKS

Mary G. Mangano, 1525 E. Putnam Apt. 305, Old Greenwich, Conn. 06370

Filed Dec. 16, 1983, Ser. No. 562,230
Int. Cl.³ B42D *9/00*
U.S. Cl. 116—234 **2 Claims**



1. An adjustable bookmark for paperback and hard cover books, comprising:

an integral non-stretchable member including an adjustable loop portion and a portion, having a free end;

said adjustable loop portion being adapted to fit around one cover of a book, the cover having a top edge and a bottom edge;

adjustable loop defining means affixed to one end of said non-stretchable member and operatively engaging another portion of said non-stretchable member to define said adjustable loop portion;

a portion of said non-stretchable member extends from said adjustable loop defining means to the distal end of the free end of said non-stretchable member defining a marker portion;

a decorative member attached to said marker portion at a position remote from the adjustable loop defining means so that when said adjustable loop is adjusted by moving said adjustable loop defining means to fit said adjustable loop portion tightly around one cover of a book and said adjustable loop defining means is positioned adjacent the top edge of the cover, said marker portion will extend downwardly from the adjustable loop defining means and may be positioned to mark a desired page of the book with said decorative member aiding in pulling said marker portion downwardly, said non-stretchable member being dimensioned so that when said adjustable loop portion fits tightly around the cover of the book and said marker portion is marking the desired page of the book said decorative member will extend slightly beyond the bottom edge of the cover; and

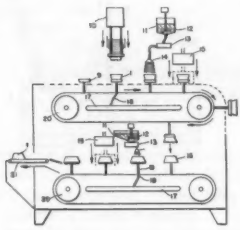
a second adjustable loop defining means affixed to a first portion of said marker portion and slidably mounted to a second portion of said marker portion to form a second adjustable loop portion for further adjusting the location of said decorative member relative to the bottom edge of the cover.

4,505,220

APPARATUS FOR COATING AND FLAVORING ICE CREAM CONES

Herbert M. Bank, and Irving H. Rubenstein, both of Owings Mills, Md., assignors to Maryland Cup Corporation, Owings Mills, Md.

Division of Ser. No. 175,374, Aug. 5, 1980,. This application Aug. 19, 1981, Ser. No. 294,243
Int. Cl.³ B05C *7/02, 7/04, 11/08*
U.S. Cl. 118—16 **3 Claims**



1. A continuous apparatus for providing a barrier coating composition on the interior and exterior surfaces of an edible food container which comprises

a first conveyor system containing a plurality of container receiving stations,

a second conveyor system containing a plurality of container receiving stations, said second conveyor being disposed below said first conveyor system,

a vacuum system operatively associated with the container receiving stations of the first and second conveyor systems,

a dispensing means for sequentially placing the edible food containers in the container receiving stations of the first conveying system,

coating means operatively associated with the first conveyor system for coating the internal surface of the edible food container with the barrier coating composition,

means operatively associated with the first conveyor system for spinning and drying the barrier coating composition in the internal surface of the edible food container,

means for moving the first conveyor system to invert the edible food container to a position above a container receiving station disposed on the second conveyor system and transferring said edible food container to said container receiving station on the second conveyor system in an inverted position,

coating means operatively associated with the second conveyor system for coating the external surface of the edible food containers with the barrier coating composition, and

means operatively associated with the second conveyor system for spinning and drying the barrier coating composition on the external surface of the edible food container.

4,505,221

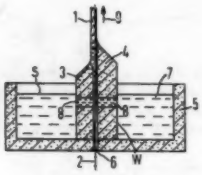
DEVICE FOR ASYMMETRICALLY COATING A TAPE-SHAPED CARRIER BODY WITH SILICON FOR FURTHER PROCESSING INTO SOLAR CELLS

Richard Falckenberg, Unterhaching; Helmut Foell, Munich, and Josef Grabmaier, Berg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,756
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1982, 3231268
Int. Cl.³ B05C *3/15, 11/02*
U.S. Cl. 118—101 **6 Claims**

1. Apparatus for asymmetrically coating a tape-shaped carrier body with crystallized silicon, for further processing into

solar cells, said apparatus comprising a melt vat accepting a silicon melt, said silicon melt having a melt surface in said vat, said melt vat having a floor part underlying the silicon melt and having a channel for the guidance of a tape-shaped carrier body, said channel extending from the floor part of the vat up to above the surface of the silicon melt and having a tape-shaped carrier body supplied to said channel from below the floor part of said vat, and being removed from the channel above the melt vat after the tape-shaped carrier body has



travelled through said channel, said channel having means comprising two lip portions extending to respective different heights relative to the melt surface at opposite sides of the tape-shaped carrier body at the upper end of the channel and defining a crystallization region where the molten silicon is crystallized to asymmetrically coat the tape-shaped carrier body, and means providing communication between the melt in the vat channel for supplying silicon from the melt to the crystallization region.

4,505,222

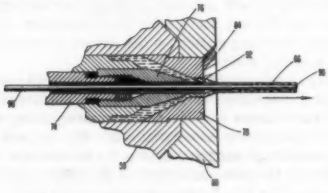
EXTRUSION COATING APPARATUS

Anne Holt, Westfield, and James Krutzler, Edison, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 15, 1984, Ser. No. 589,961

Int. Cl.³ B05B *17/00*; B05C *5/00*

U.S. Cl. 118—304 **9 Claims**



1. A die assembly for the extrusion coating of elongate cores, comprising:

a nozzle having an orifice therethrough,

means defining a through-bore aligned with said orifice so that a core can be conducted through said through-bore and orifice,

a passage arranged for conducting a flowable coating material into and through said orifice,

a hollow guide tube slidably mounted in said through-bore and sized to receive the core,

said slidable guide tube being positionable such that the forward end thereof is adjustably movable relative to said nozzle orifice to vary the location of the point at which the coating material contacts the core.

4,505,223

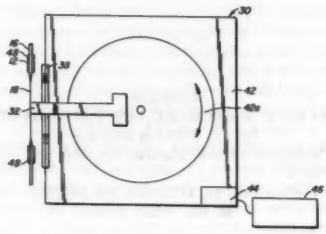
OPTICAL FIBER COATING APPARATUS

Jack E. Goodman, Germantown, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 28, 1983, Ser. No. 546,617

Int. Cl.³ B05C *9/02*

U.S. Cl. 118—401 **20 Claims**



1. An apparatus for coating an object comprising:

a base member;

a reversibly rotatable disc attached to said base member;

means coupled to said disc for reversibly rotating said disc;

a control arm having a first end connected to said disc;

a guide wheel connected to said control arm;

a fluid applicator head connected to an end of said control arm opposite to said first end, said applicator head having two halves defining a fluid reservoir;

a control track associated with said guide wheel, said control track having two upper portions and a lower portion therebetween; and

a holder for the object to be coated removably connected to said base member, said holder positioning the object to be coated within said fluid reservoir during at least a portion of the rotation of said reversibly rotatable disc.

4,505,224

APPARATUS FOR ELECTROSTATICALLY COATING ELONGATED WORKPIECES WITH FLOCK

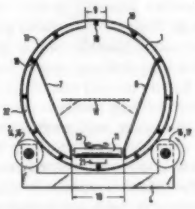
Jürgen Kranz, Lindau, Fed. Rep. of Germany, assignor to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 2, 1983, Ser. No. 529,026

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1982, 3232687

Int. Cl.³ B05B *5/02*

U.S. Cl. 118—636 **6 Claims**



1. Apparatus for electrostatically flock coating elongated work pieces on a conveyor belt, wherein flock is charged by an electrostatic field drops upon a workpiece from a feed opening located above the workpiece to be flock-coated, and excess flock is collected at the bottom of the apparatus and returned to the feed opening, comprising a stationary cylindrical inner housing having a substantially horizontal longitudinal axis and formed with a feed opening, the feed opening being elongated and located in a region of said cylindrical housing on an upper

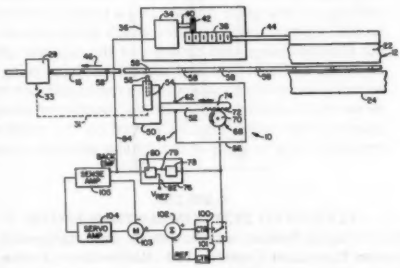
apex line thereof, the housing being also formed with a discharge gap in a lower region thereof whereat the conveyor belt is simultaneously disposed; a cylindrical outer jacket coaxially surrounding and spaced from said cylindrical inner housing and being rotatable about the inner housing; and elastic transport strips disposed in the space between said inner housing and said outer jacket and fastened to said outer jacket, said elastic transport strips extending along generatrix lines and bridging said space between said inner housing and said outer jacket so as to define therewith respective other gaps for retaining therein given amounts of flock, said other gaps being displaceable about the periphery of said stationary cylindrical inner housing to the feed opening.

4,505,225

SELF-ALIGNING APPARATUS FOR SEMICONDUCTOR LEAD FRAME PROCESSING MEANS

Syed Husain, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 31, 1983, Ser. No. 528,016
Int. Cl.³ B05C *13/02*
U.S. Cl. 118—669 **8 Claims**



1. Apparatus for aligning a processing device with a semiconductor lead frame travelling along a path, said apparatus comprising: an actuator device having a retractable projection capable of entering a reference hole in the semiconductor lead frame; means for moveably mounting the actuator device along the path, said actuator device adapted to be coupled with a source of power for urging the projection into a reference hole of an adjacent lead frame, whereby the actuator device will move with the lead frame when the projection is in the reference hole of the lead frame; means coupled with said actuator for generating an output signal as a function of the distance through which the actuator moves with the lead frame; a drive means capable of being coupled to the processing device for moving relative to the lead frame in response to the output signal.

4,505,226

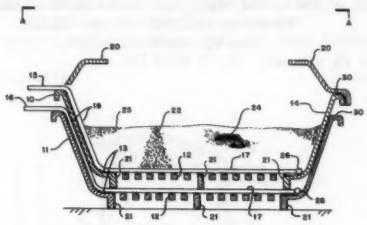
LITTER-CLEANING ANIMAL LITTER BOX

Greg A. Carlson, 223 Hickok Rd., New Canaan, Conn. 06840

Filed Feb. 14, 1984, Ser. No. 580,011
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—1 **20 Claims**

1. In combination with animal litter receptacle means:

False bottom means adapted to be positioned in said receptacle means whereby said receptacle and false bottom means are cooperatively adapted to receive and hold animal litter, said false bottom means being constructed and arranged so as to be substantially rigid over that portion thereof that engages and supports said animal litter and made from a material having the necessary adhesive characteristics and configured so that the wetted litter engaging said portion of said false bottom means will ahdere thereto so that said false bottom means can be removed from said receptacle means contents and mechanically worked whereby said wetted litter is then released from said false bottom means for disposal, said false bottom means being constructed and arranged so as to be substantially rigid over that portion thereof that engages and



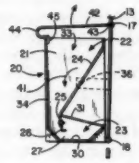
supports said animal litter so that said portion of said false bottom means will not flex sufficiently to release said wetted litter during removal of said false bottom means from said receptacle means contents.

4,505,227

FEEDER FOR SMALL PIGS

Charles A. Hartke, and Francis A. Brummer, both of Teutopolis, Ill., assignors to Farmweld, Inc., Teutopolis, Ill.

Filed Feb. 24, 1984, Ser. No. 583,148
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—52 R **7 Claims**



1. In combination with a pen wall forming one wall of a pen for young livestock having an opening of substantial size therein in relation to the size of the pen wall and defined by upper and lower edges, the improvement comprising a pivoting feeder assembly including means for forming pivot support members along the lateral sides of said opening, the feeder assembly being pivotably mounted on said supports, the feeder assembly being of size to substantially block the opening in such pen wall when in a first working position, said feeder assembly including:

a hopper portion having a filling opening at the top thereof positioned on the outside of the pen when the feeder assembly is in a working position, the hopper portion being defined in part by a forward wall and a hopper wall which inclines in direction downwardly and outwardly from the pen from adjacent a top edge of the feeder with the feeder assembly in its working position and defining a generally horizontal laterally extending opening at a lower portion thereof;

the feeder assembly including a trough portion on the opposite side of said hopper wall from said hopper portion and defining an opening accessible from the interior of a pen formed with the pen wall, the trough portion holding feed from the hopper portion and being accessible to livestock on the interior of such pen; and

a latch on the exterior of the pen wall that is releaseable upon movement in a single pivoting direction to permit the feeder assembly to pivot so that the upper portions move into the interior of a pen on which such pen wall is

mounted about the pivot axis until the trough portion is substantially inverted.

4,505,228

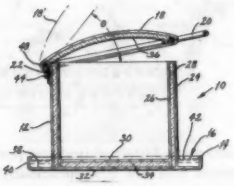
DOG FEEDER

John H. Scott, 5054 Maple Ave., St. Louis, Mo. 63113

Filed Aug. 11, 1983, Ser. No. 522,110

Int. Cl.³ A01K *5/01, 7/00*

U.S. Cl. 119—62 **1 Claim**



1. A dump-proof, safely-used feeder for dogs for protecting and preserving food or fresh water to be made available to a dog upon self-initiated action of the dog, the feeder comprising an insulating vessel of generally cylindrical, upright configuration for receiving food or water, a closure secured to such vessel for normally covering and closing the vessel but being hinged to the vessel for being liftable against the force of gravity by the dog for permitting access by the dog to the vessel interior and contents therein, and an insect-isolating tray forming a moat around the vessel, for receiving in the moat water or other liquid for providing a barrier to insects to prevent them from entering the vessel, characterized by the moat being carried by the vessel at the lower end of the vessel and extending radially outwardly therefrom at the lower end of the vessel around its periphery in the form of a radial, horizontal flange having an upstanding lip to provide said moat with an annular configuration, and for increasing the stability of the feeder without use of extrinsic stabilizing structure, the vessel defining a peripheral upper edge, the closure being of dome-shaped configuration and providing a downwardly turned peripheral edge of rounded, blunt character for extending over and slightly below the peripheral upper edge of the vessel, the closure including a rounded, blunt extension extending laterally outwardly beyond such downwardly-turned peripheral closure edge for permitting the dog to raise the closure by action of its nose upwardly against such outward extension, and outwardly extending tabs, each including an aperture, at opposite sides of the feeder above the moat and integral to the feeder for stable securement of the feeder to a supportive surface, thereby to prevent the feeder from being dumped over or moved by the dog.

4,505,229

AUTOMATIC WASHING MACHINE FOR DOGS AND LIKE ANIMALS

Mario Altissimo, Via Bologna 220, Torino, Italy

Filed Dec. 6, 1983, Ser. No. 558,494

Claims priority, application Italy, Dec. 10, 1982, 54051/82[U]

Int. Cl.³ A01K *13/00*

U.S. Cl. 119—158 **21 Claims**

1. An automatic washing machine for animals, such as dogs and the like, comprising:

a rigid, generally cylindrical casing having a substantially horizontal axis in its position of use, said casing including a flat bottom, two ends of which one defines an aperture for the head of an animal placed in the casing in use, and an openable part for allowing the admission and escape of the animal;

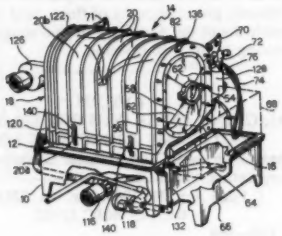
a plurality of inwardly-facing spray nozzles in said casing;

washing means for supplying a washing liquid to the nozzles under pressure;

drying means for supplying pressurized air to the nozzles, and

a central programming and control unit for controlling the washing and drying operations of the washing and drying means in a predetermined operating cycle,

wherein the improvement comprises said casing being formed, between the two ends, by an axial series of contiguous annular modular elements connected together axially, each of said annular elements having a double wall defining an interspace divided into a plurality of first and second separate axial passages which communicate with the corresponding axial passages of the adjacent annular elements, and said first and second passages being connected respectively to said washing means and said drying means and communicating with said nozzles whereby the length of the casing may be altered by the addition or removal of one or more of the annular modular elements.



4,505,230

FLUIDIZED BED COMBUSTION UNITS

Peter B. Caplin, Sunbury on Thames, England, assignor to The Energy Equipment Company Ltd., Bedfordshire, England

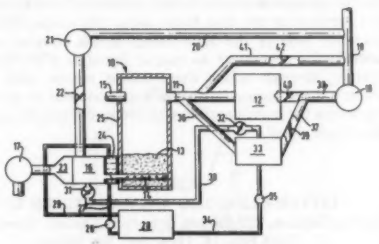
PCT No. PCT/GB81/00204, § 371 Date Jun. 7, 1982, § 102(e) Date Jun. 7, 1982, PCT Pub. No. WO82/01239, PCT Pub. Date Apr. 15, 1982

PCT Filed Sep. 28, 1981, Ser. No. 387,876

Claims priority, application United Kingdom, Oct. 6, 1982, 8032112

Int. Cl.³ F22B *1/00*

U.S. Cl. 122—4 D **5 Claims**



1. A method of operating a fluidized bed combustion unit arrangement in which fluidizing gas is fed to a bed of particulate material via one or more arrays of sparge tubes or pipes extending generally horizontally through the bed, to fluidize the bed and support combustion of fuel passed thereto, wherein the fluidizing gas is formed by mixing in variable proportions air, an inert gas and steam, the steam reacting endothermically within the bed when the bed is operating to effect both physical and chemical attemperation or control of the temperature of the bed supplementing attemperation provided by the inert gas, the method providing the use of a waste heat boiler to generate the steam, to which boiler a proportion of the flue

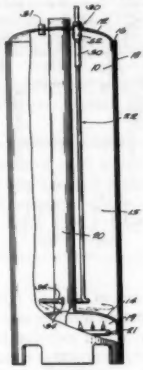
gases drawn from the unit are passed, the proportion of flue gases passed to the waste heater boiler being controlled in accordance with the proportion of steam required to be generated and passed to the fluidized bed in the combustion unit.

4,505,231

WATER HEATER CONSTRUCTION WITH SEDIMENT REMOVAL MEANS

Rodney R. Syler, Fairview, Tenn., assignor to Apcom, Inc., Franklin, Tenn.

Filed Mar. 15, 1984, Ser. No. 589,948
Int. Cl.³ F22B *7/00*
U.S. Cl. 122—159 **8 Claims**



1. A water heater comprising:

a water tight tank means adapted to contain water under pressure, said tank means including a tank wall and a top and bottom head member;

a source of heat for heating water inside said tank means;

a hot water outlet means located in the top portion of said tank means through which hot water can be periodically withdrawn from the top portion of said tank means;

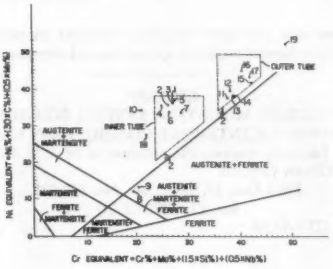
a tubular agitator means mounted in said tank, said tubular agitator means including a straight vertical portion, a first curved portion lying in a substantially vertical plane and a second curved portion lying in a substantially horizontal plane adjacent the bottom head of said tank means, said straight vertical portion having an inlet end terminating in the top of said tank means and adapted for connection to a source of water under pressure, said first curved portion having at least one opening in the underside thereof through which a stream of water is directed in the same general direction as the water flowing through the tube itself, said second curved portion extending at least 180° and having a plurality of openings therein through which streams of water will be directed into said tank means each time water is drawn out of the top portion of said tank means through said hot water outlet means, said openings in said second curved portion positioned so that some of the streams of water will be directed downwardly and outwardly toward the tank wall and other of the streams of water will be directed downwardly and inwardly from the tank wall, all of said streams being directed in the same general direction as the water flowing through the tube itself to produce a swirling action in the bottom portion of said tank means each time hot water is drawn out of said hot water outlet means, said swirling action effective to cause solid particles which have either settled to the bottom or are in the process of settling to the bottom to be swept up and maintained in suspension in the water so that ultimately at least a portion of such materials will be carried upwardly in said tank means and out said hot water outlet means.

4,505,232

BOILER TUBE

Kenichi Usami; Seishin Kirihara; Hiroyuki Doi; Choichi Asano, all of Hitachi; Masayuki Sukekawa, Kitaibaraki, and Yasuhide Sakaguchi, Kure, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 27, 1984, Ser. No. 593,931
Claims priority, application Japan, Mar. 28, 1983, 58-50495
Int. Cl.³ F22B *37/06*
U.S. Cl. 122—511 **10 Claims**


OUTER TUBE
INNER TUBE
AUSTENITE + MARTENSITE
AUSTENITE + FERRITE
AUSTENITE MARTENSITE FERRITE
MARTENSITE FERRITE MARTENSITE
MARTENSITE + FERRITE
FERRITE
Ni EQUIVALENT = Ni% + 30 × C% + 0.5 × Mn%
Cr EQUIVALENT = Cr% + Mo% + (1.5 × Si%) + (0.5 × Nb)%

1. A boiler tube having a double-tube structure constituted by an inner tube and an outer tube integrated with each other, characterized in that:

said inner tube is made of an alloy consisting essentially of, by weight, 0.02 to 0.15% of C, 0.5 to 3.5% of Si, not greater than 2% of Mn, 25 to 40% of Ni, 20.5 to 27% of Cr, 0.5 to 3% of Mo, not greater than 1% of Nb and the balance Fe and having a substantially fully austenite structure; and

said outer tube is made of an alloy consisting essentially of, by weight, 0.02 to 0.2% of C, not greater than 3.5% of Si, not greater than 2% of Mn, 33 to 45% of Ni, 30 to 40% of Cr and the balance Fe and having a substantially fully austenite structure.

4,505,233

PISTON ASSEMBLY WITH COOLING LUBRICANT RESERVOIR DEFINING MEMBER WITH A DEEP NARROW RESERVOIR AND A SHALLOW WIDE RESERVOIR

Mutsumi Kanda; Souichi Matsushita; Kiyoshi Nakanishi, and Tokuta Inoue, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 25, 1984, Ser. No. 623,933
Claims priority, application Japan, Jan. 24, 1984, 59-010678
Int. Cl.³ F01P *3/10*; F02F *3/20*
U.S. Cl. 123—41.35 **7 Claims**

1. For an internal combustion engine:

a piston assembly, comprising:

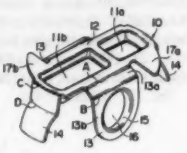
(a) a piston main body, comprising a piston crown portion and a generally hollow cylindrical piston wall portion joining thereto which together define a generally cup shaped structure;

and

(b) a lubricant reservoir defining member comprising a shelf plate portion and mounted within said cup shaped structure of said piston main body with said shelf plate portion generally parallel to and opposing said piston crown portion, so as to define a chamber space between said piston crown portion and said shelf plate portion;

said shelf plate portion being formed with first and second depressions which define first and second lubricant reservoirs having first and second ends and first and second volumes, respectively, the ratio of the surface area of said first lubricant reservoir to the surface area of said second lubricant reservoir being less than the ratio of the volume of said first lubricant reservoir to the volume of said sec-

ond lubricant reservoir; said chamber space being supplied with lubricant at a portion thereof adjacent to said first



depression and open to drain lubricant therefrom at a portion thereof adjacent to said second depression.

4,505,234

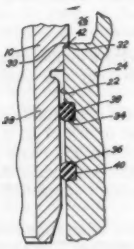
WET SLEEVE MOUNTING SYSTEM FOR SLEEVE CYLINDERS OF INTERNAL COMBUSTION ENGINES

Elmo R. Meiners, Anchor, Ill., assignor to M & W Gear Company, Gibson City, Ill.

Filed Dec. 17, 1982, Ser. No. 450,525

Int. Cl.³ F02F 1/10

U.S. Cl. 123—41.84 **2 Claims**



1. In an internal combustion engine of the type including a cylinder block, said block having cylinder bores for receipt of separate cylinder sleeves, each of said separate sleeves having a circumferential side surface, a top perimeter and a bottom perimeter section, said side surface being spaced from the bore to provide a fluid passage for coolant intermediate the top perimeter and bottom perimeter section, said top perimeter and bottom perimeter section being sealed to the block to prevent leakage of coolant from the passage, the improvement of means to simultaneously support the sleeve and for insuring electric conduction between the sleeve and block at the bottom perimeter section to prevent electrolytic pitting of the sleeve and attendant cavitation of coolant in the passage, said means comprising a circumferential flange on the sleeve at the bottom perimeter section; a circumferential land in the bore of the block opposed to the flange of the sleeve by maintaining the flange in overlaying relation to the land; and a circumferential conductive metal ring member compressed between the flange and land, said land, ring member and flange defining a conduction path, said land defining a support surface for the sleeve.

4,505,235

VALVE TIMING MECHANISMS OF INTERNAL COMBUSTION ENGINES

Stephen W. Mitchell, Bury, England, assignor to National Research Development Corporation, London, England

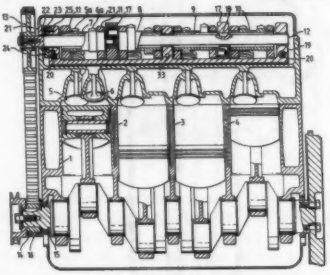
Continuation of Ser. No. 220,856, Dec. 29, 1980, abandoned. This application Sep. 26, 1983, Ser. No. 535,556

Claims priority, application United Kingdom, Jan. 2, 1980, 8000052

Int. Cl.³ F01L 1/34

U.S. Cl. 123—90.17 **23 Claims**

1. An internal combustion engine comprising: a rotary output member; at least one cylinder driving that output member; an inlet valve and exhaust valve for each cylinder; a single camshaft arrangement carrying both an inlet cam to operate said inlet valve and an exhaust cam to operate said exhaust valve, said camshaft arrangement being rotatable and including means constraining said inlet cam and said exhaust cam to rotate at the same speed at all times; driving connection means between said camshaft arrangement and said rotary output member for effecting rotation of said camshaft such that each complete revolution of the camshaft corresponds to a constant quantity of revolution of said rotary output member, said driving connection means being operable to vary, within each complete revolution of said camshaft, the angular position of



the camshaft about its axis of rotation relative to the angular position of said rotary output member and to vary the angular velocity of said rotary output member to thereby vary the valve timing, said driving connection means including at least one rotatable intermediate member, a moving mounting for at least one of said intermediate member and said camshaft arrangement whereby movement of said movable mounting varies the radial distance of said cams from the axis of said rotation of said intermediate member, said variation of said radial distance causing said variation of the timing of said valves; and a device responsive to the engine speed of said engine to impart said movement to said mounting.

4,505,236

VALVE OPERATING ARRANGEMENT OF AN INTERNAL COMBUSTION ENGINE

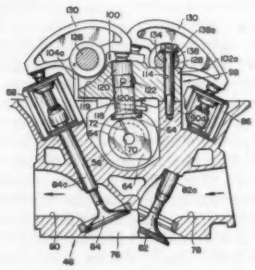
Makoto Nakamura, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed May 31, 1983, Ser. No. 499,253

Claims priority, application Japan, Jun. 1, 1982, 57-93784; Jun. 9, 1982, 57-98930; Jan. 26, 1983, 58-9621[U]; Jan. 26, 1983, 58-10784

Int. Cl.³ F01L 1/46

U.S. Cl. 123—90.27 **17 Claims**



1. A valve operating arrangement of an over-head cam type internal combustion engine, comprising:

a cylinder head operatively carrying thereon a cam shaft on which cams are securely mounted to rotate therewith;

a monoblock supporting member detachably mounted on said cylinder head, said supporting member having a unit serving a combustion chamber of said engine, said unit comprising an elongated major portion having a longitudinal axis and groups of leg portions on opposite sides of said axis connected by said major portion and adapted to be seated on said cylinder head, leg portions of each group being longitudinally spaced with respect to each other and staggered with respect to leg portions of an opposite group, said elongated major portion of said unit of said supporting member having a pair of longitudinally arranged through holes adjacent said axis and located between opposite groups of leg portions in alignment with corresponding cams on said cam shaft;

valve lifters slidably received in said through holes of said supporting member, one end of each valve lifter being in contact with the corresponding cam on said cam shaft; and

a rocker shaft mounted on said supporting member between spaced leg portions of each group pivotally supporting thereon a rocker arm, one end of each rocker arm being in contact with the other end of one of said valve lifters.

4,505,237

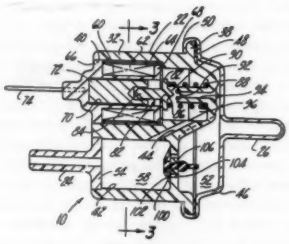
VACUUM CONTROL DEVICE

Paul Heimnick, Owosso, Mich., assignor to Schmelzer Corporation, Flint, Mich.

Filed Apr. 8, 1983, Ser. No. 483,259

Int. Cl.³ F02M *1/14*

U.S. Cl. 123—179 G **12 Claims**



1. A control device for an internal combustion engine having a spark ignition system, a vacuum source, and a vacuum operated device, comprising: a housing including an inlet port adapted for connection to a vacuum source and an outlet port adapted for connection to a vacuum operated device, a wall in said housing forming chambers at opposite sides communicating with said inlet and outlet ports, respectively, a valve seat formed in said wall, motor means responsive to energization of said spark ignition system to close said valve seat and responsive to de-energization to open said valve seat, a one way valve in said wall between said chambers permitting fluid flow from said outlet port to said inlet port in the presence of vacuum pressure at said inlet port and preventing fluid flow in the opposite direction through said valve means, said valve seat remaining closed during energization of said spark ignition system to isolate said outlet port from said inlet port and maintain vacuum pressure at said vacuum operated device once the latter has been actuated.

4,505,238

GASTIGHT, UNDETACHABLE CONNECTION OF TWO METAL PARTS

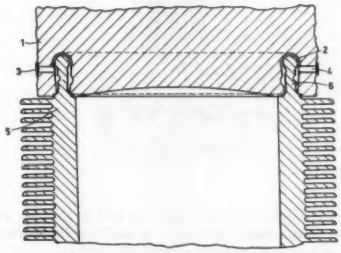
Friedrich Jordan, Kurten, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 329,003, Dec. 9, 1981, Pat. No. 4,469,060. This application Jun. 18, 1984, Ser. No. 621,429

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046776

Int. Cl.³ F02F *1/00*

U.S. Cl. 123—193 CH **4 Claims**



1. A positive, gastight, undetachable die cast connection of two metal parts which form a unit with a seal tightness therebetween to reduce initial prestressing and deformation during subsequent treatment, comprising a bulb-shaped groove in one of said two parts, and a bulb-shaped counterpiece associated with the other of said two parts, said groove having a base which is wider than its opening and said groove having inclined sidewalls which are further apart at the base of said groove than at the opening thereof, with the base of said groove being circular, said counterpiece having a head which is wider than its base and said counterpiece having inclined sidewalls which are further apart adjacent the head of said counterpiece than at the base thereof with an annular depression surface joining together its head and sidewalls, with the head of said counterpiece being circular, said counterpiece being inserted in said groove in such a way as to form an annular chamber therebetween, said annular chamber being filled with pouring of molten metal under pressure, said inclined sidewalls and circular head of said counterpiece assuring an occlusion-free pouring since sharp corners and edges are avoided on which dirt and gas bubbles can settle while eliminating cracks or fissures caused by sharp corners and edges, which occur under great mechanical and thermal loads acting thereon, at least one of the sidewalls of at least one of said groove and said counterpiece being provided with grooving.

4,505,239

INTERNAL COMBUSTION ENGINE

Olivier Deland, 821 Normandie No. 18, St. Jean, Quebec, Canada J3A 1K6

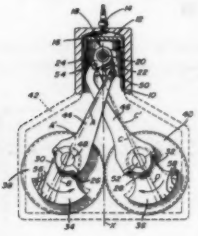
Filed Mar. 8, 1984, Ser. No. 587,691

Int. Cl.³ F02B *75/32*

U.S. Cl. 123—197 AC **12 Claims**

1. In an internal combustion engine including a cylinder defining a combustion chamber adapted to receive a combustible mixture for the combustion thereof, and a piston slidably mounted in said cylinder for reciprocating movement between a first limit position whereat the combustion chamber defines its minimum volume and a second limit position whereat the combustion chamber defines its maximum volume, the improvement comprising a pair of rotatably mounted parallel crank-shafts arranged equidistantly relative to the longitudinal axis of said cylinder and each having a crank-arm rotatable about its respective crank-shaft axis, means coupling said crank-shafts together for synchronising the rotation thereof

with the crank-arm of one of said crank-shafts having an angular advance over the crank-arm of the other crank-shaft, a rocker member pivotally connected to said piston for rocking movement about a pivot axis extending normal to the longitudinal axis of said cylinder, and a pair of connecting rods interconnecting said rocker member and the respective crank-arms of said crank-shafts with each said connecting rod being pivotally connected to said rocker member, said rocker member together with said connecting rods defining a position control means for enabling said rocker member to rock when said



piston reaches said first limit position and to thereby maintain said piston substantially stationary at said first limit position for a period of time sufficient to permit the crank-arm of said one crank-shaft to move past dead-center, whereby substantially maximum compression is achieved in said combustion chamber during a compression stroke of said piston when said piston is at said first limit position while the crank-arm of said one crank-shaft is positioned past dead-center such that upon combustion of said combustible mixture substantially maximum thrust is imparted to said piston.

4,505,240

FUEL INJECTION PUMP OF THE DISTRIBUTOR TYPE

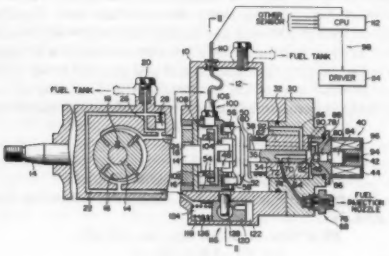
Kazuo Shinoda, Toyota; Masahiko Miyaki, Oobu; Akira Masuda, Aichi, and Hiroshi Koide, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed May 30, 1984, Ser. No. 615,343

Claims priority, application Japan, May 31, 1983, 58-96644

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—357 **11 Claims**



1. A fuel injection pump of the distributor type for delivering fuel to cylinders in an internal combustion engine comprising:

a pump head provided with a pump chamber therein into which fuel is to be fed;

at least one pump plunger arranged in the pump head which reciprocates to pressurize the fuel in the pump chamber in the pump head;

a driving shaft which rotates in synchronism with the engine;

converter means for reciprocating the pump plunger by the rotation of the driving shaft to pressurize the fuel in the pump chamber, and provided with an adjusting member for enclosing the driving shaft and which is rotatingly shifted around the axis of the driving shaft to adjust a timer at which the fuel in the pump chamber is pressurized in relation to the rotary phase angle of the driving shaft;

timer means for adjusting the angle of the rotatingly shifted adjusting member of the converter means, depending upon the operation of the engine;

means for distributing and deliverying successively into each of the cylinders in the engine the fuel in the pump chamber which has been pressurized by the pump plunger;

adjusting means for adjusting the amount of pressurized fuel delivered to each of the cylinders in the engine by allowing, at a predetermined timing, the fuel which is to be pressurized in and delivered from the pump chamber in the pump head to escape;

a plurality of to-be-detected portions located on the outer circumference of the driving shaft used to detect the rotary angle of the driving shaft;

sensor means for detecting the to-be-detected portions on the driving shaft and then generating signals which represent the rotary angles of the driving shaft, which is provided with a sensor fixed to the adjusting member of the converting means; and

control means for detecting the fuel pressure starting time on the basis of the signals supplied from the sensor means and for rendering the fuel amount adjusting means operative after the elapse of a predetermined delay time after the fuel has been pressurized.

4,505,241

GOVERNOR FOR FUEL INJECTION PUMP

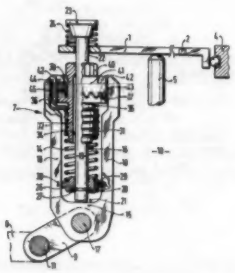
Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 559,655

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1983, 3301416

Int. Cl.³ F02D *1/04, 17/06*

U.S. Cl. 123—373 **7 Claims**



1. In a speed governor of a fuel injection pump for internal combustion engines having a governor lever for adjusting the supply quantity and an rpm-dependent force applying means engaging the governor lever, a governor spring assembly interposed between the governor lever and an adjusting lever, said spring assembly having at least one spring that is prestressed between a first support means coupled to the adjusting lever and a second support means coupled to the governor lever, one of said support means being multi-parted, said first and second support means in an outset position being held in contact with one another by the force of said spring, and adjusting means for varying the initial stress of said one spring, said one spring being nonrotatably coupled at spaced locations thereon with one of said support means and at one end protruding into and engaging a thread on a first part of said multiple-

part support means, said first part being rotatable about the axis of the thread relative to a second part of the multiple-part support means and being coupled under the influence of the force of the spring in a positively engaged manner with said second part.

4,505,242

CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

Max Straubel, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

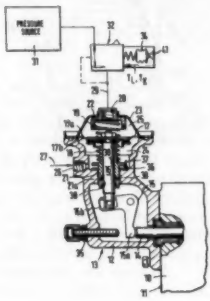
Division of Ser. No. 123,532, Feb. 22, 1980, Pat. No. 4,416,233. This application Sep. 16, 1983, Ser. No. 533,028

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1979, 2908792

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.³ F02D *1/06, 1/14*

U.S. Cl. 123—383 **6 Claims**



1. In an air pressure dependent full-load stop for limiting the movement of a supply quantity adjustment member of a fuel metering apparatus for an internal combustion engine in accordance with induced air-pressure in an intake manifold of the engine, which includes a housing, a movable wall disposed within the housing separating in a pressure-tight manner a first pressure chamber from a counterpart pressure chamber which are defined by the housing and the movable wall, an adjustment member means actuated by the movable wall for limiting the movement of the supply quantity adjustment member, connecting means for connecting the first pressure chamber to the intake manifold of the engine, and a first spring in the pressure chamber and a second spring in the counterpart pressure chamber for exerting a force on the movable wall to determine an initial disposition of the movable wall, wherein the movable wall is displaceable by the induced air pressure of the engine against the force of the second spring, the improvement which comprises:

an overpressure source means for generating a reference absolute pressure including,

an air overpressure source of the engine;

an absolute pressure controller containing an evacuated diaphragm pressure box for maintaining the reference absolute pressure at a predetermined absolute pressure level; and

second connecting means for connecting the overpressure source means to the counterpart pressure chamber which is sealed off from the outside—and wherein the balance of forces between the first and second spring and the pressures in the first pressure chamber and the counterpart pressure chamber determines the position of the adjustment member means and the full load injection quantity.

4,505,243

ELECTROMAGNETIC INJECTION CONTROL VALVE IN UNIT FUEL INJECTOR

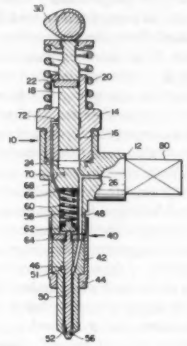
Hiromichi Miwa, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed May 16, 1984, Ser. No. 610,871

Claims priority, application Japan, Jul. 4, 1983, 58-121442; Jul. 22, 1983, 58-134186

Int. Cl.³ F02M *57/02*

U.S. Cl. 123—446 **4 Claims**



1. In a unit fuel injector for an internal combustion engine, the injector including an injection pump portion having a pressure chamber which includes an end portion of a cylinder in which a pump plunger reciprocates in synchronism with revolutions of the engine, an injection nozzle portion having a valve disposed in a valve chamber communicating with said pressure chamber so as to normally remain in its closed position to close spray-holes and lift to its open position when the fuel pressure transmitted from said pressure chamber to said valve chamber increases to a predetermined level, and an electromagnetic injection control valve means which is provided to a fuel passage extending from said pressure chamber and has a valve member normally kept in its open position by a resilient biasing means such that a fuel pressure transmitted from said pressure chamber through said fuel passage acts on a tip portion of the valve member and an electromagnetic means for bringing said valve member to its closed position in response to an electrical current pulse signal to thereby prevent leak of the fuel pressure in said pressure chamber through said fuel passage,

the improvement comprising said electromagnetic injection control valve means has a back-pressure chamber defined in a supplementary cylinder into which a cylindrical member in the form of an axial extension of said valve member fits and a pressure-balancing passage through which the fuel pressure transmitted from said pressure chamber and acting on said tip portion of said valve member is transmitted to said back-pressure chamber.

4,505,244

FUEL INJECTION SYSTEM

Edward D. Smith, Greensburg, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

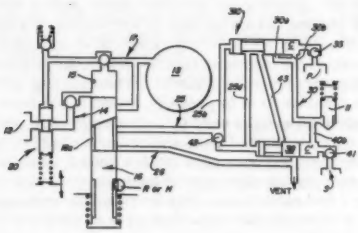
Filed May 6, 1982, Ser. No. 375,661

Int. Cl.³ F02M *47/02, 45/06*

U.S. Cl. 123—447 **23 Claims**

1. A fuel injection system for a multi-cylinder internal combustion engine having a pair of fuel injectors for each cylinder, said system comprising a source of fluid; a high pressure accumulator for the fluid; a first plunger mounted for reciprocatory movement within a first chamber; a power actuated cam responsive to the operating demands of the engine and movably engaging a first portion of said first plunger and effecting

controlled axial movement of the latter toward one end portion of said first chamber; a first rail extending from said fluid source to said chamber one end portion, fluid flowing to said chamber one end portion when said first plunger has moved away from said chamber one end portion; a second rail extending from said chamber one end portion to said accumulator, fluid flowing through said second rail to said accumulator only when said first plunger is moving in a direction toward said chamber one end portion; a primary fuel metering second plunger mounted for reciprocatory movement within a second chamber; a third rail connected to said first chamber at a location axially spaced from the connections of said first and second rails to said first chamber, said third rail having a first section extending to one end portion of said second chamber and a second section extending to one end portion of a third chamber and to a central portion of said second chamber; a secondary fuel metering third plunger mounted for reciprocatory movement within said third chamber; a fourth rail connected to said first chamber at a location axially spaced a greater distance from the first chamber one end portion than said third rail and having a first segment extending to a central portion of said second chamber, a second segment extending to a vent, and a third segment extending to a central portion of said third chamber; a fifth rail extending from said second chamber to one of the pair of cylinder fuel injectors, said fifth rail having a first segment connected to the central portion of said second chamber and a second segment connected to a second end portion of said second chamber; a sixth rail connected to the second end portion of said second chamber and



extending to a source of primary fuel, the second segment of the fifth rail and the sixth rail being in communication with one another when the second plunger assumes a first relative position within the second chamber; a seventh rail connected to a second end portion of said third chamber and extending to a source of secondary fuel; an eighth rail having a first segment connected to the central portion of the third chamber and a second segment connected to the second end portion of the third chamber; said eighth rail extending to a second of the pair of cylinder fuel injectors; a first groove formed in and encompassing the exterior of said first plunger and having a non-uniform axial dimension, the minimum axial dimension being at least as great as the axial spacing between the second and third rail connections to said first chamber and as great as the axial spacing between the third and fourth rail connections to said first chamber; a second groove formed in the exterior of the second plunger, the axial dimension of said second groove being at least as great as the axial spacing between the connections of the first segment of the fourth rail and the first segment of the fifth rail with said second chamber; a third groove formed in the exterior of the third plunger, the axial dimension of said third groove being at least as great as the axial spacing between the connections of the third segment of the fourth rail and the first segment of the eighth rail with the third chamber; and adjustable means engaging said first plunger for effecting selective movement of the latter about its longitudinal axis whereby the effective axial length of the first groove of said first plunger varies relative to said second and third rail connections to said first chamber.

4,505,245

FUEL PUMPING APPARATUS

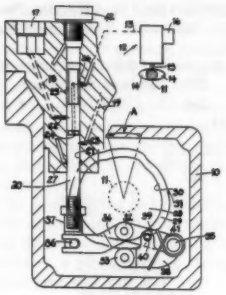
Edward R. Lintott, London, England, assignor to Lucas Industries plc, Birmingham, England

Filed Jun. 24, 1982, Ser. No. 391,963

Claims priority, application United Kingdom, Jul. 4, 1981, 8120720; Dec. 31, 1981, 8139165

Int. Cl.³ F02M *41/04*

U.S. Cl. 123—451 **6 Claims**

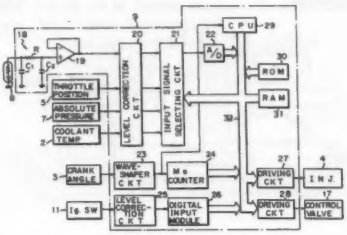


1. A fuel pumping apparatus for supplying fuel to a multi-cylinder internal combustion engine comprising a pump plunger slidable within a bore, an outlet from said bore, a drive shaft rotatably mounted within a housing of the apparatus and arranged in use to be driven in timed relationship with an associated engine, first cam means carried by the drive shaft for imparting inward movement to the plunger, valve means for controlling the quantity of fuel displaced through said outlet during the inward movement of said plunger, a pair of fuel outlets in the housing connected in use, to fuel injection nozzles respectively of the associated engine, a distributor member mounted in the housing, drive means connecting the distributor member and the drive shaft whereby the distributor member operates in timed relationship to connect the outlet from the bore to said fuel outlets in turn during successive inward movements of the plunger, said drive means comprising further cam means carried by said shaft, a pair of rollers engaging said further cam means, said further cam means defining a pair of opposed cam profiles, said rollers engaging said cam profiles respectively, a pair of levers mounting the rollers respectively, a pivot post about which the levers can pivot, means adjustably mounted on the distributor member and engaged by one of said levers, a pin carried by one of the levers and an aperture in the other lever, said pin being located in said aperture but being slightly smaller than said aperture to allow limited relative movement of the levers, and resilient means acting on the levers in a direction to urge the rollers into contact with the respective cam profiles, whereby as the drive shaft is rotated axial movement will be imparted to the distributor member, said further cam means being arranged so that the distributor member during each revolution of the drive shaft connects the outlet from the bore to each of said fuel outlets in turn.

4,505,246
METHOD FOR OPERATING A CLOSED LOOP AIR/FUEL RATIO CONTROL SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Toyohei Nakajima, Shiki, and Takehiko Hosokawa, Yokohama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Matsushita and Matsushita Electric Industrial Co., Ltd., Osaka, both of, Japan

Filed Aug. 17, 1983, Ser. No. 524,051
Claims priority, application Japan, Aug. 19, 1982, 57-143732
Int. Cl.³ F02M *51/00*
U.S. Cl. 123—489 **6 Claims**



1. A method for operating a closed loop air/fuel ratio control system of an internal combustion engine determining an air/fuel ratio of a combustible mixture to be supplied to the engine in accordance with an output signal of an exhaust gas oxygen sensor having a current source connected to a terminal of the exhaust gas oxygen sensor for obtaining a counter electromotive force due to an internal resistance of the exhaust gas oxygen sensor and a filter means including a capacitor connected between the terminal of the exhaust gas oxygen sensor and a ground, comprising the steps of:

supplying an electric current from said current source to said exhaust gas oxygen sensor;

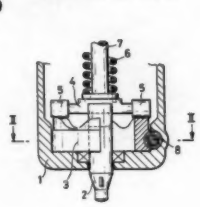
discriminating whether a predetermined time period has passed after an initiation of the supply of said electric current to said exhaust gas oxygen sensor; and

initiating a discrimination of an activation state of said exhaust gas oxygen sensor after the predetermined time period has passed.

4,505,247
SYSTEMS FOR VARYING THE ADVANCE OF AN INJECTION PUMP, PARTICULARLY OF THE DISTRIBUTOR TYPE

Manuel R. Nierga, Barcelona, Spain, assignor to Spica S.p.A., Livorno, Italy

Filed Mar. 30, 1983, Ser. No. 480,323
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1982, 3212524
Int. Cl.³ F02M *59/20*
U.S. Cl. 123—500 **18 Claims**

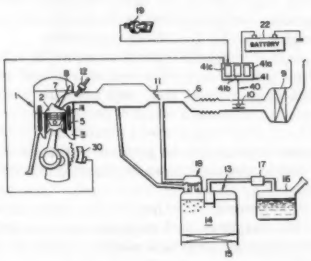


1. A fuel injection pump comprising a casing, a pump unit including a piston adapted for reciprocal and rotary motion relative to said casing, cooperative cam means and cam follower means within said casing for controlling the reciprocal motion of said piston, one of said cam means and cam follower means being carried by said piston and the other of said cam means and cam follower means being carried by said casing, said cam means and cam follower means being in engagement with each other drive means for imparting generally continuous rotary motion to said piston and to one of said cam means and cam follower means along a generally circumferential path to thereby generally continuously rotate said piston and said one cam means and cam follower means, the other of said cam means and cam follower means being disposed along said circumferential path, means for selectively intermittently circumferentially adjusting the position of said other of said cam means and cam follower means relative to said casing and circumferentially about the axis of rotation of said piston, said selective circumferential adjusting means including worm means carried by said casing for meshing with and imparting selective opposite rotation to thread means of the other of said cam and cam follower means upon rotation of said worm means, said worm means and thread means being further operative for preventing movement of the other of said cam means and cam follower means relative to said casing in any position of relative selective circumferential adjustment when said worm means is stationary, means for imparting selective rotary movement to said worm means which through said thread means is effective to directly circumferentially adjust the other of said cam means and cam follower means along said circumferential path and thereby vary the operation of said piston, and means for rotatably supporting said worm within bore means of said casing.

4,505,248
HOT-WIRE AIR FLOWMETER CONTROL SYSTEM FOR ENGINE

Haruo Yuzawa, and Kazuhiro Sunamura, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Jun. 15, 1984, Ser. No. 621,254
Claims priority, application Japan, Jun. 21, 1981, 58-111727
Int. Cl.³ F02M *33/02*
U.S. Cl. 123—519 **5 Claims**



1. A system for controlling a hot-wire air flowmeter including a hot wire provided for an internal combustion engine having an ignition switch and a canister for storing and supplying fuel evaporated from a fuel tank into an intake passage according to engine operating conditions, said control system comprising:

(a) ignition detecting means for detecting whether the ignition switch is turned on or off;

(b) engine stop detecting means for detecting whether the engine is running or stopped; and

(c) air-flowmeter controlling means having:

(1) air-flow measuring means for measuring the amount of air flowing through the intake passage on the basis of the amount of heat radiated from the hot wire when cooled by the air;

(2) burning means for allowing a large current to pass through the hot wire for a fixed time period to heat up

the hot wire for removal of contaminations sticked onto the hot wire; and

(3) large-current controlling means responsive to said ignition detecting means and said engine stop detecting means for activating said burning means to allow a large current to pass through the hot wire for the fixed time period when a first predetermined time period has elapsed after said ignition detecting means detected that the ignition switch was turned off, only when said engine stop detecting means detects that the engine is running a second predetermined time period before said ignition detecting means detects that the ignition switch is turned off.

4,505,249

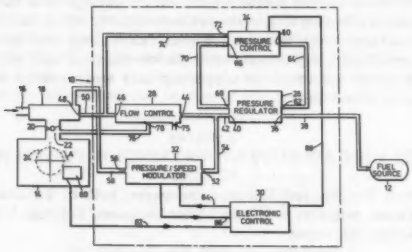
FUEL CONTROL SYSTEM FOR GASEOUS FUELED ENGINES

Colin G. Young, Mississauga, Canada, assignor to EMCO Wheaton International Limited, Toronto, Canada

Filed Apr. 30, 1984, Ser. No. 605,274

Int. Cl.³ F02B *43/00*

U.S. Cl. 123—527 **11 Claims**



1. A fuel control system for use in supplying gaseous fuel from a high pressure source of gaseous fuel to an internal combustion engine which has an air/fuel intake through which air and gaseous fuel is supplied to the engine and means indicative of engine loading conditions comprising:

(a) a pressure regulator having an input for receiving pressurized gaseous fuel from said source and an output for discharging gaseous fuel, said pressure regulator being adapted to maintain a constant pressure in the discharging fuel for a given engine speed regardless of flow rate and to increase or decrease the pressure in the discharging gaseous fuel in response to an increase or decrease in engine speed,

(b) a flow control valve having an input communicating with the output of said pressure regulator and an output communicating with said air/fuel intake of said engine, said flow control valve having a valve actuator member which communicates with said means which is indicative of engine loading conditions so as to be operable to control the flow of gaseous fuel from its output in response to engine loading conditions regardless of engine speed,

(c) control means communicating with said engine for measuring the speed of the engine and generating a first signal which is indicative of the engine speed,

(d) modulator means communicating with the output from the pressure regulator to measure the pressure of the fuel supply to the flow control valve, said modulator also communicating with the control means to receive said first signal, said modulator means being adapted to compare the measured pressure with the measured speed and to generate a third signal which is indicate of an undesirably low pressure or a fourth signal which is indicative of an undesirably high pressure, said third or fourth signals being communicated to said control means,

(e) pressure control means communicating with said pressure regulator to increase or decrease the pressure in the gaseous fuel output in response to the receipt of said third or fourth signals respectively.

4,505,250

VARIABLE VENTURI CARBURETOR

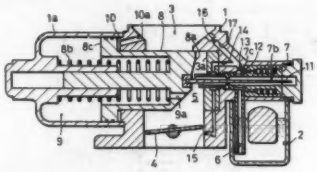
Toshikatsu Hada, Aichi, and Yukinori Isoya, Nagoya, both of Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Japan

Filed Feb. 24, 1983, Ser. No. 469,533

Claims priority, application Japan, Mar. 23, 1982, 57-41591[U]

Int. Cl.³ F02M *31/20*

U.S. Cl. 123—540 **4 Claims**



1. In combination with a variable venturi carburetor for an internal combustion engine in an automobile having a carburetor body, a float chamber, an air intake passage, a venturi portion provided in said air intake passage, a fuel passage communicating with said float chamber and said venturi portion, a main fuel jet provided in said fuel passage, a suction piston transversely movable with respect to said venturi portion in response to the load conditions of the engine and adapted to be slidably mounted in a cylindrical portion of said carburetor body, a fuel metering needle fixed at its base for controlling the annular opening area of a fuel metering portion of said main fuel jet by reciprocating motion of said suction piston and a fuel well defined in said main fuel jet; the improvement comprising an air layer for insulating heat transmitted from said carburetor body to said fuel well and extending continuously uninterrupted longitudinally on the outer circumference of said main fuel jet and a heat insulator layer surrounding said air layer and extending continuously uninterrupted around said air layer.

4,505,251

CUTTING SEGMENT WITH POROUS CENTER SECTION

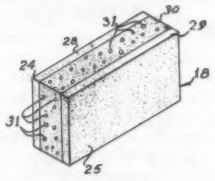
Martin Stoll, P.O. Box 410 520, 75 Karlsruhe 41, Fed. Rep. of Germany

Filed Feb. 8, 1983, Ser. No. 464,905

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1982, 3204276

Int. Cl.³ B28D *1/04*

U.S. Cl. 125—15 **3 Claims**



1. In a stone cutting segment, wherein said segment is formed of a cement having diamonds dispersed therein, said segment having a cutting edge, side sections arranged perpendicularly to said cutting edge, and a center section disposed between said side sections so that said side sections and said

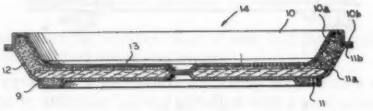
center section form said cutting edge, both said side sections and said center section being formed of said cement having diamonds dispersed therein, the improvement wherein said center section includes a relatively soft material as compared to said cement dispersed therein, said relatively soft material being within a plurality of individual pores substantially uniformly distributed throughout said center section, said relatively soft material filling all said pores.

4,505,252

HOLLOW DISHES WITH MELTABLE CORES AND METHOD OF MAKING SUCH DISHES

Takashi Wada; Masaru Wada, both of Tsubame, and Toshi Matsu, Tokyo, all of Japan, assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Sep. 9, 1983, Ser. No. 530,816
Int. Cl.³ A47G *23/04*
U.S. Cl. 126—246 **9 Claims**



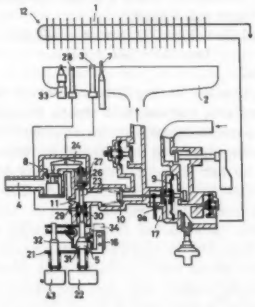
1. A method for making a hollow dish having a core containing cavity and with a discrete, meltable core substance comprising: liquefying said meltable substance in a substantially oxygen-free inert atmosphere to prevent degradation of said meltable core; cooling and solidifying said meltable substance in said inert atmosphere to form a meltable core for said dish; placing the solidified meltable core substance inside said hollow dish core containing cavity; removing substantially all oxygen and water from said core-containing cavity inside said hollow dish; filling the space of said hollow dish core containing cavity not occupied by said meltable core with an inert atmosphere to prevent degradation of said meltable core; and sealing said hollow dish to preclude escape of said meltable core substance and inert atmosphere from said cavity and to substantially preclude oxygen and water from entering said cavity.

4,505,253

WATER HEATER

Sueo Mizuno; Katsushi Mizutani, and Masahiko Koumura, all of Nagoya, Japan, assignors to Rinnai Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 2, 1984, Ser. No. 576,310
Claims priority, application Japan, Feb. 4, 1983, 58-14490[U]
Int. Cl.³ F23H *1/00*
U.S. Cl. 126—351 **4 Claims**



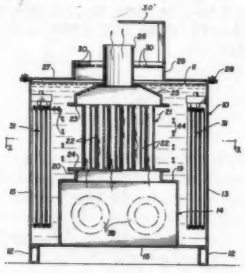
1. A water heater of the type having a main burner for heating a heat exchanger and a standing burner, and an electromagnetic safety valve adapted to be opened by a manual operation member and to be kept in its valve open condition by an electric current from a thermocouple element exposed to the standing burner and a water pressure sensitive member, which opens in response to the supply of water to the heat exchanger being turned on are interposed in a fuel passage connected to the main burner, and a standing burner fuel passage connected at one end to the standing burner and at its other end to a point located in between the two valves, and additionally there is provided a control circuit which comprises a capacitor, a discharging circuit for the capacitor with a solenoid which operates the electromagnetic safety valve which is interposed therein, and a changeover switch adapted to be so operated by the manual operation member as to connect the capacitor selectively to either an electric power source or the discharging unit, characterized in that the control circuit includes a subsidiary discharging circuit for the capacitor with a control switch which is interposed therein and is adapted to be closed when the supply of water to the heat exchanger is on, said subsidiary discharging circuit being in parallel with the foregoing discharging circuit and including a resistance means for delaying the discharge of said capacitor, and said control circuit having a resistance interposed between the two discharging circuits.

4,505,254

WATER HEATER FOR DIVERS AND FOR OTHER USES

Arthur G. Wigdahl, 107 Dillard St., New Iberia, La.

Filed Mar. 29, 1983, Ser. No. 479,994
Int. Cl.³ F24B *9/00*
U.S. Cl. 126—367 **2 Claims**



1. A water heater particularly for delivering warm water to the suits of divers in the sea, comprising a substantially rectangular upright shell adapted for placement on shipboard and adapted to be substantially filled with fresh water, said shell having an open top, a cover plate removably secured to the top of said shell and substantially covering the open top of the shell and having a substantially central sleeve extension rising from the cover plate, the cover plate having an opening registering with the lower end of the sleeve extension, a plurality of spaced horizontal splash plates fixed within the sleeve extension at an elevation somewhat above the top of the shell and said cover plate and serving to vent the interior of the shell to atmosphere, a fire box fixed within the bottom of the shell and being rectangular and having its vertical walls spaced from corresponding vertical walls of the shell and having a top wall disposed at an elevation within the shell substantially above the bottom wall of the shell, the fire box being adapted to be surrounded on all of its sides and at its top by fresh water contained within the shell, connecting means extending between a vertical wall of the firebox and a vertical wall of the shell and being in communication with said firebox, burner means mounted to said connecting means, a primary heat exchanger fixedly mounted on top of the fire box and including a multiplicity of vertical axis fire tubes rising above the top of

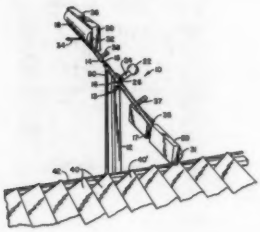
the fire box and being disposed centrally in the shell and being adapted to be surrounded by fresh water in the shell, the fire box having a top opening in communication with bores of the fire tubes, an exhaust stack means mounted on the top of the primary heat exchanger within the upper portion of the shell and including a vertical axis exhaust stack extending above the elevation of said splash plates, the splash plates having an opening receiving the exhaust stack for venting exhaust gases and stabilizing said exhaust stack, a pair of parallel connected secondary heat exchangers within the shell near opposite vertical walls of the shell and being disposed on opposite sides of the fire box and primary heat exchanger in spaced relationship thereto, the secondary heat exchangers comprising banks of heat exchanger coils having their tops and bottoms spaced from the cover plate and bottom wall of the shell and extending vertically for the major portion of the combined height of the fire box and primary heat exchanger, sea water inlet and outlet connections with said secondary heat exchangers through one wall of the shell, whereby sea water can be pumped continuously through the secondary heat exchangers and delivered to the suit of a diver and then expelled from said suit into the sea, and emergency back-up heat exchanger elements penetrating into the interior of the shell through one wall thereof and being adapted to be surrounded by fresh water within the shell.

4,505,255

SUMMER/WINTER SOLAR CONTROL SYSTEM

Stephen C. Baer, Albuquerque, N. Mex., assignor to Zomeworks Corporation, Albuquerque, N. Mex.

Filed Nov. 14, 1983, Ser. No. 550,710
Int. Cl.³ F24J *3/02*; E05F *15/20*
U.S. Cl. 126—419 **13 Claims**



1. A solar actuated louver system for providing shade in the summer and maximizing solar heating in the winter, said system comprising:

a plurality of overlapping, interconnected louvers pivotable about parallel axes;

a solar tracker having a frame pivotable between fixed stops, said tracker including a pair of alternative tracking modes, a winter mode in which the frame is oriented toward the sun, and a summer mode in which the frame is oriented away from the sun;

a counterweight attached to the frame and adjustable between a winter position which puts the center of gravity of the tracker and counterweight below the pivotal axis of the frame to stabilize the frame when the frame is oriented toward the sun, and a summer position which puts the center of gravity of the tracker and counterweight above the pivotal axis of the frame to render the frame bistable against either stop when the frame is oriented away from the sun; and

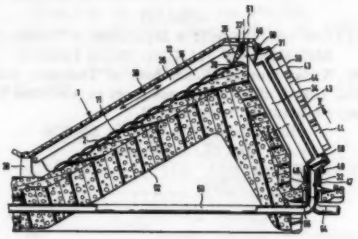
means for linking the louvers to the frame so that direct sunlight passes between the louvers in the winter mode and is blocked by the louvers in the summer mode.

4,505,256

SOLAR COLLECTOR AND ABSORBER

Hermann Kirchmayer, D-8121 Antdorf, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,925
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214843; Nov. 12, 1982, 3241925
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—422 **19 Claims**



1. In a dual mode device for converting solar energy into heat, comprising a solar collector having a plurality of collector elements mounted on a support surface, coupled together, and connected to a heat transfer fluid circuit containing a circulating heat transfer fluid, each of which collector elements is comprised of a first heat transfer fluid channel which faces the sun and is associated with a heat transfer fluid circulation pump, and each of which collector elements has a second channel which is oriented perpendicularly to the first channel and is in contact with the surrounding air, and wherein: (1) in a first operating mode of said first channel in which it operates as a collector, said first channel is connected to a first branch containing a high temperature reservoir; and (2) in a second operating mode of said first channel, in which it operates as an absorber, said first channel is cut off from the first branch by means of a controlled reversing valve when the temperature of the circulating heat transfer fluid is less than a predetermined minimum temperature, as measured by means of a temperature sensor, and is connected to a second branch containing a low temperature reservoir; the improvement comprising a chamber disposed about the upper side of the first channel, which faces the sun below a light-transmitting cover, said chamber having an air inlet and air outlet means providing contact between said chamber and the surrounding air only when the temperature in the chamber is less than a predetermined value.

4,505,257

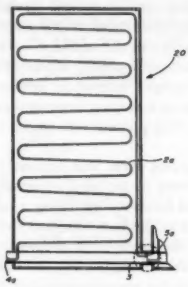
SOLAR COLLECTOR AND ARRANGEMENTS THEREOF

Hai N. Nguyen, Greenfield Park, Canada, assignor to 118343 Canada Inc., Montreal, Canada

Filed Nov. 17, 1982, Ser. No. 442,242
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—432 **4 Claims**

1. In a solar collector having fluid conveying means, in an energy absorbing area thereof, said means having fluid inlet and outlet means communicating with a further fluid conveying means for use in supplying fluid to said conveying menas in said area, said further fluid conveying means comprising a tubular member having a bore extending therethrough, including intermediate points of communication of said inlet and outlet means with said further fluid conveying means, said fluid conveying means in the energy absorbing area comprising a tubular member whose bore is smaller than that of said further fluid conveying means, said inlet and outlet means each comprising a mouth, at least one of which depends within said further fluid conveying means and is orientated such that it faces in a direction away from the other of said mouths, said direction being generally in common with that of the longitudi-

nal axis passing through said further fluid conveying means, whereby fluid flowing through said fluid conveying means in said area uses the velocity effect of said fluid flowing through said further fluid conveying means.



4,505,258

LIGHT COLLECTING TYPE OF SOLAR ENERGY COLLECTING SYSTEM

Yu Taek Yoon, 43-25 (1 Tong 3 Ban), Chusoeng-dong, Yongsan-ku, Seoul, Rep. of Korea

Filed Nov. 8, 1982, Ser. No. 439,987

Claims priority, application Rep. of Korea, Mar. 16, 1982, 82-7123; Sep. 9, 1982, 82-1983

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—424 **7 Claims**

1. A solar energy collecting system comprising:

a case defining an inner cavity and including a transparent window for permitting incident solar rays to pass therethrough,

an inlet pipe for supplying cold water,

an outlet pipe for discharging hot water,

a plurality of water heating elements disposed in said inner cavity of said case to receive incident solar rays which pass through said transparent window, each said element including an outer transparent cylindrical tube, and a water tube defining an interior space through which water passes, said outer tube and said inner tube defining therebetween a vacuum chamber, wherein

said plurality of water heating elements are serially connected to one another between said inlet pipe and said outlet pipe by means of an L-type of tube socket and a union, said outer tube being enclosed at both ends by caps having an opening eccentrically defined relative said cylindrical outer tube, said outer tube further including concave reflector means formed on one half the inner surface of said outer tube to convergingly reflect said incident solar rays, said water tube defining an opposing pair of parallel planar side surfaces, between cross-sectionally circular opposing ends, said opposing ends mounted in said openings so that said water tube is eccentrically disposed relative said outer tube; and

means mounting said outer and inner tube with respect to each other to permit parallel alignment of said side surfaces with respect to said incident solar rays, said rays converging upon said side surfaces by virtue of said reflector means to elevate the temperature of the water flowing through said water tube, and wherein

said transparent window has the configuration of zigzag surfaces, said concave reflectors and said zigzag surfaces each capable of facing the incident solar rays when said system is installed perpendicularly on a wall.

4,505,259

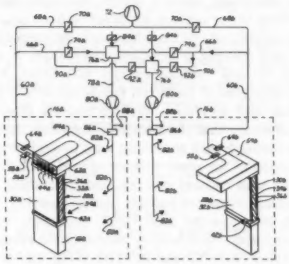
HEAT REGULATION SYSTEM AND METHOD FOR BUILDING STRUCTURE

Olli Seppanen, Bellevue, Wash.; Antero Punttila, Kerava, and Jukka Sulku, Helsinki, both of Finland, assignors to Ekono, Inc., Bellevue, Wash.

Filed Aug. 17, 1981, Ser. No. 293,137

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—429 **16 Claims**



1. In a building structure a system for minimizing energy losses in the building structure, wherein there is a predetermined temperature range within which said system is to maintain the temperature in the building structure during a predetermined time period, said temperature range having a lower temperature limit, said building structure being characterized in that it has a predicted time/temperature curve along which indoor temperature rises from said lower to said higher limits during the predetermined time period, said system further comprising:

(a) a window structure comprising:

(i) an exterior panel positioned at an exterior surface of the building,

(ii) an interior panel spaced inwardly from said exterior panel to define a plenum between the exterior and interior panels,

(iii) solar energy absorbing means located in said plenum,

(iv) said window structure having first intake opening means to permit air in said building structure to flow into said plenum to be in heat exchange relationship with the heat absorbing means, and first outlet opening means to permit said air to flow from said plenum,

(b) temperature sensing means to sense actual temperature in the building structure,

(c) first valve means selectively operable to recirculate air from said plenum in said building structure and to selectively add air from outside the building structure to the recirculated air,

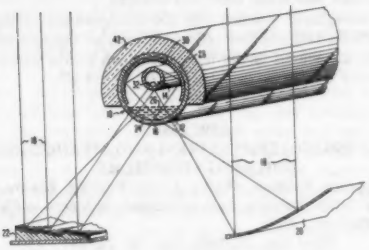
(d) control means to compare the actual temperature with predicted temperature at any specific time and to selectively operate the first valve means to introduce cooler outside air into the building structure to lower the actual temperature toward the predicted temperature.

4,505,260

RADIANT ENERGY DEVICE

James B. Metzger, Princeton, N.J., assignor to Metzger Research Corporation, Princeton, N.J.

Filed Sep. 9, 1982, Ser. No. 406,253
Int. Cl.³ F24J 3/02
U.S. Cl. 126—433 **9 Claims**



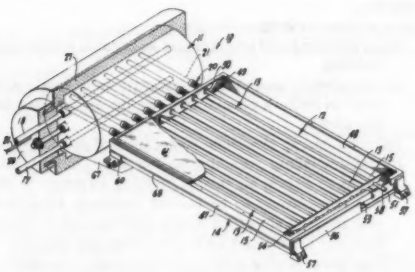
1. a radiant energy device comprising a hollow collector having an enclosing wall, a target structure having a dark, heat-absorbing outer surface, enclosed within and spaced from said hollow collector wall, a portion of the inner surface of said collector wall having a concave curvature, a volatile fluid transparent to said radiant energy but being absorptive of longer wavelengths of infra-red radiation within said concave wall portion and having a surface spaced from said target structure whereby said fluid forms a lens for converging radiant energy through said enclosing wall to said target structure, another portion of the inner surface of said collector wall being reflective to said radiant energy and extending around said target structure to direct radiant energy passing through said converging lens toward said target structure whereby said fluid is heated and vaporized by radiation emanating from said target structure, and means for removing the vapor of said volatile fluid includes means for providing a partial vacuum within said hollow collector.

4,505,261

MODULAR PASSIVE SOLAR HEATING SYSTEM

Billy D. Hunter, R.R. 1, Box 94A, Paso Robles, Calif. 93446

Filed Dec. 19, 1983, Ser. No. 562,844
Int. Cl.³ F24J 3/02
U.S. Cl. 126—433 **6 Claims**



1. A passive solar energy storage system comprising:

a tank for releasably storing heat in a fluid such as water contained therein;

at least one heat tube for releasably storing radiant energy incident thereon as heat in a vaporizable fluid contained therein and having at least one axial heat collector fin;

a double-walled heat exchanger comprising first and second tubes, the first tube being releasably mounted to and extending into the interior of the tank and itself being adapted to slidably receive the heat tube as the second tube thereof for transferring heat stored in the vaporizable heat tube fluid to the reservoir fluid medium;

the double-walled heat exchanger having at least one channel formed between the first and second tubes for venting the interior space to the ambient;

a heat tube housing comprising a lower base having a peripheral wall structure extending upwardly therefrom, the housing forming a unitary structural system with the tank such that the tank provides structural support to the housing; and

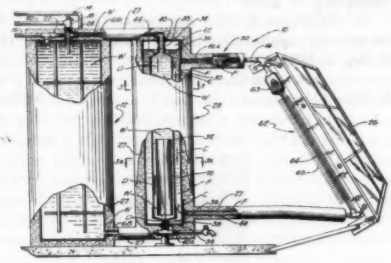
the housing having first and second oppositely situated openings formed in the wall structure for receiving the heat tube, and further comprising a support plate extending transverse to the heat tube and having a profile corresponding to the transverse cross-section outline of the finned heat tube for supporting the heat tube in a selected orientation and for permitting sliding insertion of the heat tube into and removal of the heat tube from the tank.

4,505,262

PASSIVE SOLAR HEATED SYSTEM

Douglas W. Eaton, P.O. Box 605, Irvine, Ky. 40336

Filed Sep. 9, 1983, Ser. No. 531,153
Int. Cl.³ F24J 3/02
U.S. Cl. 126—435 **10 Claims**



1. A solar heating system, comprising:

a solar collector;

a storage tank;

a heat exchanger formed of first and second substantially straight-line pipes having respective pairs of end caps and reducer elements to close the ends;

means for circulating working fluid through said solar collector and heat exchanger, said solar collector increasing the thermal energy of the working fluid, said means to circulate the heated working fluid causing the fluid to flow from said solar collector and enter said heat exchanger at the first end of said first pipe and exit at the second, opposite end of said first pipe before returning to said solar collector; and

means for transferring water between said storage tank and said heat exchanger, said water flowing from said storage tank and entering said heat exchanger at the first end of said second pipe and exiting at the second, opposite end of said second pipe before returning to said storage tank;

said first and second pipes of said heat exchanger being in substantially concentric relation so that heat is transferred radially by convection from the heated working fluid to the water;

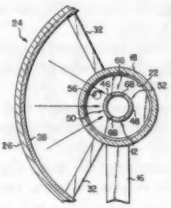
said reducer elements of said pipes being substantially concentric and positioned at each end adjacent to the end caps; and sealing means around the periphery of at least one pair of said reducer elements and a portion of the other pipe.

4,505,263

HEAT COLLECTOR

Naoyoshi Nameda; Yooji Surisawa; Yasunobu Nakamoto, all of Yokohama, and Hideshi Sekiya, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 27, 1983, Ser. No. 461,491
Claims priority, application Japan, Jan. 29, 1982, 57-12787
Int. Cl.³ F24J 3/02
U.S. Cl. 126—438 12 Claims



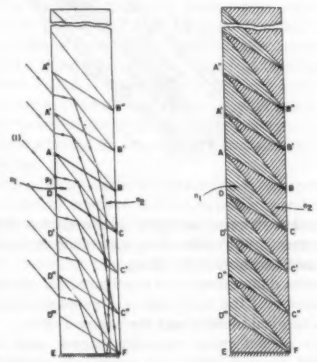
1. A heat collector for a sun utilization system comprising:
light concentrating means for concentrating solar light to an area of maximum concentration; and
a heat collecting means for allowing a heating medium to flow therethrough including bend preventing means defined by a first arcuate portion heated by solar light concentrated to said area of maximum concentration by the light concentration means and a second arcuate portion heated by direct solar light, the first and second arcuate portions are respectively formed of metal materials having different thermal expansion coefficients, whereby the first and second arcuate portions thermally expand at the same rate to prevent said pipe from bending.

4,505,264

ELECTROMAGNETIC WAVE CONCENTRATOR

Réal Tremblay, Quebec, Canada, assignor to Universite Laval, Quebec, Canada

Filed Dec. 27, 1983, Ser. No. 565,758
Int. Cl.³ F24T 3/02
U.S. Cl. 126—439 17 Claims



1. An electromagnetic wave concentrator in the form of a substantially flat thin plate having an electromagnetic wave striking surface, a surface opposed to said striking surface, and a pair of terminal edge surfaces intersected by said striking and opposite surfaces, wherein said plate is formed of a succession, between said terminal edge surfaces, of electromagnetic wave coupling modules abutting one another, so as to form a flat plate-like structure, each of said modules consisting of a pair of prisms meeting on a common surface and made of transparent materials of refraction indexes n_1 and n_2, said prism each having a base and an external surface joining said base to the common surface wherein the bases of the prisms of index n_1 are located in said wave striking surface and the bases of the prisms of index n_2 are located in said opposed surface; wherein said successive modules abut one another with the external surface of a prism of index n_1 abutting the external surface of a prism of index n_2; wherein $n_2 \geqq 1$ and $n_1 > n_2$; wherein each prism has the following further parameters wwith respect to an angle θ_1 of wave incidence upon said striking surface

$$\theta_2 \cong \cong 2c$$

$$\theta_{2c} = \sin^{-1}(n_2/n_1)$$

$$\theta_{11} \cong \theta_{2c} - \theta_a$$

$$\theta_1 \cong \sin^{-1}[n_1 \sin(\theta_{2c} - \theta_a)]$$

and wherein θ_2 is the angle of wave incidence upon said common surface; θ_{2c} is a critical value of the angle θ_2 for total inner wave reflection; θ_{11} is the angle of refraction of the waves incident upon said striking surface; and θ_a is the base angle of the prism of index n_1 defined by said striking surface and said common surface,

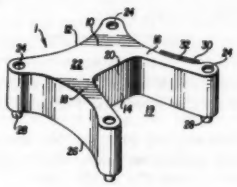
whereby waves incident upon the bases of said prisms of index n_1 are refracted in the said prisms of index n_1, then totally reflected at the said common surface and thereafter refracted by said successive modules, being thus bent toward one of said terminal edge surfaces to concentrate thereon.

4,505,265

REHABILITATION DEVICES

Anna E. Cronenwett, 443 Fourth St., Ann Arbor, Mich. 48103, and Kathleen Doyle, 4836 Rivers Edge, Troy, Mich. 48098

Filed Aug. 9, 1982, Ser. No. 406,356
Int. Cl.³ A61B 19/00; A47C 13/00; A63H 33/04
U.S. Cl. 128—1 R 7 Claims



1. An article of manufacture for deployment as a rehabilitation device comprising:
(a) a unitary central body portion having a top wall and a bottom wall, the bottom wall having a concave configuration,
(b) a pair of opposed legs integrally formed with the central body portion, the legs extending from the bottom wall and projecting above the top wall of the central body portion, each leg having an exterior side wall and an interior side wall, each interior side wall extending from the top wall of the central body portion to a junction with an associated exterior side wall,
(c) each exterior side wall of the legs and the bottom wall having a concave configuration, and
(d) fabric fastener means adhered to at least certain portions of the bottom wall, the top wall and each side wall of the legs and cooperatable with a complementary fastener means for fastening the article to another object.

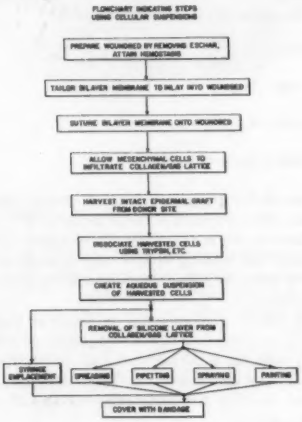
4,505,266
METHOD OF USING A FIBROUS LATTICE

Ioannis V. Yannas, Newton Center, and John F. Burke, Belmont, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 315,233, Oct. 26, 1981, Pat. No. 4,458,678. This application Apr. 17, 1984, Ser. No. 601,233

Int. Cl.³ A61B *19/00*

U.S. Cl. 128—1 R **5 Claims**


FLOWCHART INDICATING STEPS USING CELLULAR SUSPENSIONS
PREPARE WOUNDBED BY REMOVING ESCHAR, ATTAIN HEMOSTASIS
TAILOR BILAYER MEMBRANE TO INLAY INTO WOUNDBED
SUTURE BILAYER MEMBRANE ONTO WOUNDBED
ALLOW MESENCHYMAL CELLS TO INFILTRATE COLLAGEN/GAG LATTICE
HARVEST INTACT EPIDERMAL GRAFT FROM DONOR SITE
DISSOCIATE HARVESTED CELLS USING TRYPSIN, ETC.
CREATE AQUEOUS SUSPENSION OF HARVESTED CELLS
REMOVAL OF SILICONE LAYER FROM COLLAGEN/GAG LATTICE
SPREADING
PIPETTING
SPRAYING
PAINTING
COVER WITH BANDAGE

1. In the method of using a fibrous lattice which:

a. has controllable biodegradability in the presence of body enzymes;

b. provokes no substantial immune respone or inflammation when grafted or implanted into a wound;

c. has sufficiently high porosity, pore size and permeability to allow cell migration and reproduction; and

d. has sufficiently high strength to resist tearing and collapse if grafted onto a wound, the improvement comprising seeding cells into said lattice.

4,505,267
PORTABLE MASSAGING DEVICE

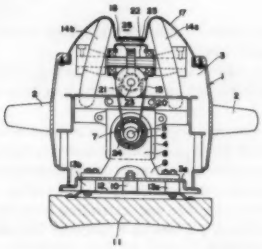
Nichimu Inada, 4-25, Morofuku 5-chome, Daitoshi, Osaka, Japan

Filed Aug. 12, 1982, Ser. No. 407,528

Claims priority, application Japan, Mar. 9, 1982, 57-32961[U]

Int. Cl.³ A61H *7/00*

U.S. Cl. 128—49 **1 Claim**



1. A portable massaging device comprising:

a casing having a handle, said handle comprising two bars extending in opposite directions so as to enable the user to grip said handle with his both hands;

a pad;

a pair of first elastic elements fixing said pad to said casing;

an electric motor in said casing;

a shaft connected to said motor;

an eccentric cam secured to said shaft of said motor;

a crank member engaging said eccentric cam whereby said crank member is caused to move up and down in a circular manner;

a pair of muscle relaxing wheels rotatably mounted in said casing and said muscle relaxing wheels are inwardly inclined towards each other;

a covering for covering said muscle relaxing wheels in contact with the rims thereof said covering being fixed to said casing;

said covering having a recess between said pair of wheels, said recess being wide enough to accommodate a neck of a user;

a first means for transmitting the drive from said electric motor to said muscle relaxing wheels, said first transmission means comprising a gearing, a belt and a pulley;

a second means for transmitting the circular motion of said crank member to said pad, said second transmission means comprising a second elastic element secured to said crank member and secured to said pad at a point adjacent to the brim of said pad; and

said first elastic elements being spaced from said second elastic element and aligned with the centerline extending along the width of said pad, thereby enabling said pad to move like a see-saw around said first elastic elements.

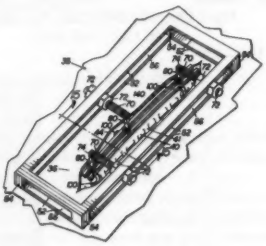
4,505,268
SCOLIOSIS FRAME

Vicente Sgandurra, 280 W. Park Dr., Sweetwater, Fla. 33173

Filed Feb. 17, 1983, Ser. No. 467,317

Int. Cl.³ A61F *5/00, 5/04*

U.S. Cl. 128—69 **14 Claims**



1. A spinal correction assembly of the type primarily designed to correct deformaties of the spine such as Scoliosis and Kyphosis, said assembly comprisidg:

frame means dimensioned and configured for placement on the exterior of the body and in communicating relation with a surgical incision and the exposed spine,

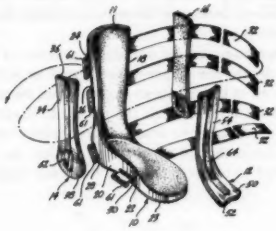
a pluraity of deformity reduction means each movably mounted on said frame and selectively positionable in communicating relation with the surgical incision,

hook means removably connected to said deformity reduction means and movably positionable therewith and including a substantially arcuate shaped hooked portion configured for at least partially surrounding relation to selected vertebrae, whereby a plurality of hook means are selectively positioned into force-bearing engagement at spaced apart points along the spine causing its intended reorientation.

4,505,269
ANKLE SPLINT

John R. Davies, and Glen V. Rice, both of1206 N. 199th, Seattle, Wash. 98133

Filed Jul. 21, 1983, Ser. No. 515,771
Int. Cl.[3] A61F 5/04
U.S. Cl. 128—87 R 13 Claims



1. A walking splint removably attachable to the lower leg and foot to substantially immobilize the ankle joint comprising:

a discrete posterior member of substantially rigid material, inflexible at the ankle joint and adapted for placement on the back of said leg, said posterior member extending from the midpoint of the calf of said leg downwardly around the heel of said foot and underlying the bottom of said foot to insure a constant right angular relationship between said leg and said foot;

a discrete anterior member of substantially rigid material adapted for placement on the front of said leg, said anterior member extending from a point substantially at the same height as an upper end of said posterior member, said anterior member overlying at least a portion of said foot;

a discrete lateral member of substantially rigid material adapted for placement over the lateral portion of said leg and extending to cover the lateral malleolus, said lateral member having a distal outward flare in the portion covering the malleolus and including a recess formed in the distal portion to anatomically conform to the lateral malleolus;

a discrete medial member of substantially rigid material adapted for placement over the medial portion of said leg and extending to cover the medial malleolus, said medial malleolus being covered by a distal portion of said medial member which is flared outwardly with respect to the remaining portion of said medial member and including a recess formed in the distal portion covering said malleolus of a size adapted to anatomically conform to the medial malleolus;

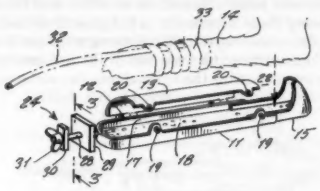
a plurality of straps vertically spaced from one another along said posterior member, said straps being operable to encircle said members and to tighten to apply tension to hold said members firmly against said leg and said foot, said straps including a means for fastening said straps.

4,505,270
FLUID ADMINISTRATION SPLINT

Betty J. Miles, Rte. 2, Box 477A, Elizabethtown, Ky. 42701

Filed May 25, 1983, Ser. No. 498,075
Int. Cl.[3] A61F 5/04, 13/00; A01K 29/00
U.S. Cl. 128—88 3 Claims

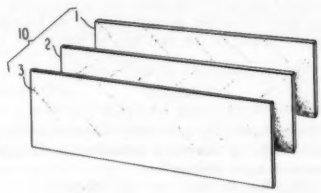
1. A fluid administration splint, comprising, in combination, a splint member and cover hinged together, an adjustable extension on a rear of the splint member, a raised peripheral lip around said splint member and extension forming a padded central depression for receiving an animal's leg having a catheter taped thereto, and a latch for rigidly securing said splint to a door of a cage containing an animal being treated.



4,505,271
APPLIANCE FOR THE RELIEF OF ARTHRITIC PAIN

Arthur Weber, 429 Lake View Dr., Bonaventure Bldg., 83, Apt. 202, Ft. Lauderdale, Fla. 33326

Filed Mar. 28, 1984, Ser. No. 594,061
Int. Cl.[3] A61F 13/00
U.S. Cl. 128—157 8 Claims



1. An appliance for the relief of arthritic pain, comprising;

a plurality of layers of elastic textile material, each stretchable in the longitudinal direction thereof and disposed in face-to-face surface contact with one another, said layers of material being joined by stitching free edges thereof in order to form a laminar structure having longitudinal and lateral edges, said layers being joined with flexible joints along the length of said longitudinal edges and with at least one stretch joint along the length of said lateral edges, and means for securing said lateral edges at least proximate one another while encircling an afflicted body part, said layers of elastic textile material being constructed so as to allow a uniform compression to be applied to said body part, and said layers of elastic textile material being sufficient in number to provide for the retention of body heat in the area of said body part.

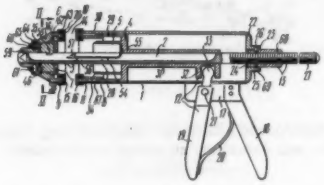
4,505,272
SURGICAL SUTURING INSTRUMENT FOR PERFORMING ANASTOMOSES BETWEEN STRUCTURES OF THE DIGESTIVE TRACT

Rustam I. Utyamyshev, Boris A. Smirnov, Nikolai N. Kanshin, Ivan A. Korolkov, and Tatyana L. Ivanova, all of Moscow, U.S.S.R., assignors to Vsesojyuzny Nauckno-Issledovatelsky i Ispytalelny Institut Meditsinskoi Tekhniki, Moscow, U.S.S.R.

Filed Feb. 22, 1983, Ser. No. 468,484
Claims priority, application U.S.S.R., Feb. 23, 1982, 3400255
Int. Cl.[3] A61B 17/11
U.S. Cl. 128—305 6 Claims

1. A surgical suturing instrument for performing anastomoses between structures of the digestive tract comprising a tubular staple case with a supporting rod passing through said

tubular case and extending outwardly therefrom with its front end, a plunger with a knife arranged coaxially within the tubular case mounted on said rod movably with respect to its front end, an abutment head mounted on the front end of said rod, said head being made detachable in the general axial direction of said rod and consisting of two members, an internal member detachably mounted on the front end of the rod, and an external member encompassing the internal member and made up of



interlockable rests, a means of interlocking the rests and the internal member along the surface of their engagement against the radial displacement of the rests of the external member, said head being provided with a supporting washer for the knife, a staple magazine arranged coaxially within the tubular case, a female die with grooves for bending staples, said female die being mounted on said head, and a drive imparting motion to the plunger with the knife, as well as a means for adjusting the gap between an end of the case and an end of the head.

4,505,273

SURGICAL STAPLE

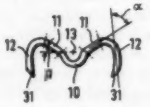
Karl Braun, Talheim, and Jurgen Fetzer, Gerstetten-Dettingen, both of Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbrucke, Switzerland

Filed Feb. 9, 1983, Ser. No. 465,319

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204532

Int. Cl.³ A61B *17/08, 17/04*

U.S. Cl. 128—335 **6 Claims**



1. A surgical staple for closing wound edges comprising a central portion and opposed side portions, the central portion including an upwardly concave arcuate region having a substantially constant radius of curvature adapted to be flattened by a stapling tool such that a substantially circular substantially downward movement of the side portions is produced, each side portion including an end section which extends approximately along an arc having a radius of curvature centered at substantially the center for the arcuate central region, and having a free end configured so as to facilitate cutting or puncturing of skin or tissue.

4,505,274

SUTURE CLIP

Irving A. Speelman, East Williston, N.Y., assignor to Propper Manufacturing Co., Inc., Long Island City, N.Y.

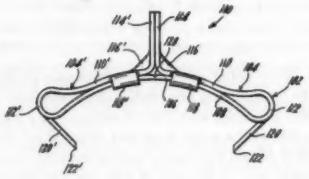
Continuation of Ser. No. 198,194, Oct. 17, 1980, abandoned. This application Oct. 12, 1982, Ser. No. 433,685

Int. Cl.³ A61B *17/08*

U.S. Cl. 128—337 **3 Claims**

1. A one-piece suture clip for holding the edges of a wound proximate to one another comprising, a continuous metal strip formed to include an arched body portion having a pair of co-acting arms, said co-acting arms including a common lower strip having a central bending portion and upper strips bent over the lower strip in overlying relationship to form loops at the opposite ends of said arms, a pair of upwardly extending tabs formed from the free ends of the upper strips overlying the central bending portion, each tab having a first upwardly extending surface in a plane of contact with an essentially parallel first upwardly extending surface of the other tab, wherein said plane of contact is directly overlying the apex of said central bending portion;

said central bending portion defining a groove of variable width and depth, the dimensions thereof in accordance with variations in the tensile strength of said metal strip so that the relationship between the tensile strength and the dimensions of said groove results in a constant force being required to bend the suture clip and so that the bending force required to utilize a plurality of suture clips is independent of variations in the tensile strength between metal strips;



reinforcing webs integrally formed between second upwardly extending surfaces of said upwardly extending tabs and the upper strips and overlying a portion of the central bending portion, said upwardly extending tabs and said strips being secured to the lower strips by lugs integrally formed with and as extensions on said upper strips and secured around a portion of the lower strips adjacent the bending portion; and

downwardly projecting prongs terminating in skin piercing points integrally formed from a portion of the lower strip at opposite ends of the arms by removing portions of the lower metal strip leaving substantially square openings therein and arranged in converging relationship to facilitate the piercing of the body tissue by the points upon bending of the suture clip into a clamping position.

4,505,275

TREATMENT METHOD AND INSTRUMENTATION SYSTEM

Wu Chen, 26 W. Ridge Pike, Royersford, Pa. 19468

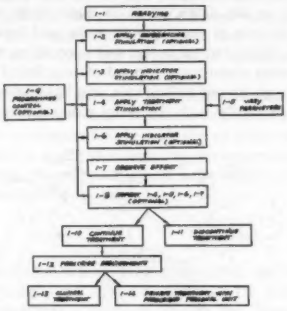
Continuation-in-part of Ser. No. 833,562, Sep. 15, 1977, abandoned, and a continuation-in-part of Ser. No. 17,846, Mar. 6, 1979, abandoned. This application Jan. 8, 1982, Ser. No. 338,066

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—421 **17 Claims**

1. A method of applying stimulation to a biological body for a desired effect, comprising the steps of applying treatment from a clinical treating unit having a set of treatment parameters, of gauging the response from the treatment object, of

selecting a subset of said of parameters which may induce the desirable effect to the said object, and of defining an individual



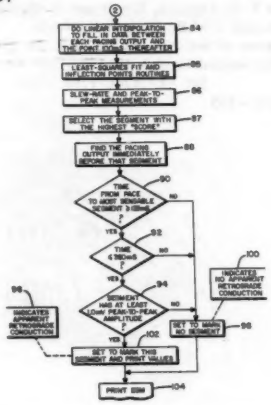
treating unit having the said subset of parameters for the individual use of said object.

4,505,276

DEVICE FOR DETECTING RETROGRADE CONDUCTION

Harold T. Markowitz, Ham Lake; John C. Rueter, Shoreview, and Edwin G. Duffin, New Brighton, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 15, 1983, Ser. No. 504,707
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—697 **9 Claims**



1. A device for detecting retrograde conduction of a heart comprising:

atrial sense means for sensing atrial chamber signals during a sampling period while the ventricular chamber is being artificially asynchronously paced with pacing pulses,

means for recording an electrogram representative of said atrial chamber signals,

means for determining when a P-wave may have been sensed within a predetermined time window after each pacing pulse and,

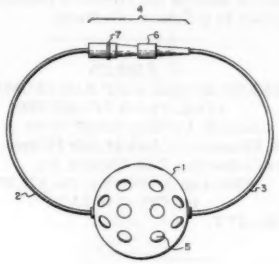
means for marking said electrogram at locations of possible P-waves.

4,505,277

IMPLANTATION DEVICE FOR USE IN VIVO STIMULATION AND COLLECTION OF MONOCYTES FROM PERITONEUM OF VERTEBRATE

Phillip H. Klesius, Auburn, and Bobby G. Brown, Notasulga, both of Ala., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 11, 1982, Ser. No. 407,232
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—769 **1 Claim**



1. An apparatus for in vivo stimulation and collection of monocytes from peritoneum of vertebrate comprising in combination the following:

(a) a spherical chamber to stimulate, receive and collect monocytes;

(b) a plurality of nylon or latex permeable membrane-covered holes in said chamber to selectively permit individual or single cell migration of said monocytes into said chamber but to exclude tissue ingrowth;

(c) a first conduit, one end of which is inserted through the side of said chamber to allow entry of fluid into said chamber;

(d) a second conduit, one end of which is inserted through an opposing side of said chamber from said first conduit side, said second conduit to allow exit of fluid from said chamber;

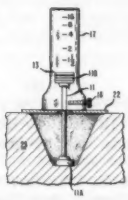
(e) a lock tip quick disconnect coupling device affixed to the ends of said first and second conduits which are not connected to said chamber, said coupling device to allow coupling of said first conduit to said second conduit and serve as a vent for the apparatus during an irrigation or aspiration process.

4,505,278

PAIN THRESHOLD GAGE AND SOFTNESS TESTER

Eugene P. Alban, 1267 S. Beach St., Daytona Beach, Fla. 32014

Filed Apr. 18, 1983, Ser. No. 485,952
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—774 **6 Claims**



1. Apparatus for measuring the softness of materials comprising:

(a) a hollow gas-tight cylinder for confining a fixed amount of gas, said cylinder having a transparent wall,

(b) a two-ended rod having a first end for pressing against the material and a second end being a piston adapted to slide in said cylinder to decrease the volume of the fixed amount of gas when said first end is pressed against the material,

(c) indicia on the transparent wall of said cylinder for indicating the decrease in volume of the fixed amount of gas, and

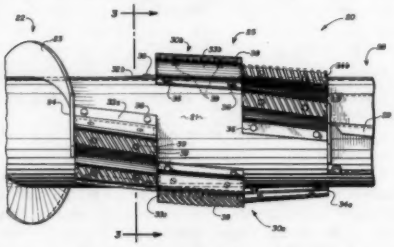
(d) a plate slidably mounted on said rod between said first and second ends outside of said cylinder, whereby said plate slides along said rod when said first end is pressed against the material and eventually contacts said cylinder to provide an indication of softness.

4,505,279

STAGGERED SPIRAL RASP BAR SEGMENTS FOR AXIAL FLOW COMBINES

Steven J. Campbell, Curitiba, Brazil; Keith A. Stickley, and David R. Klingensmith, both of New Holland, Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Aug. 8, 1983, Ser. No. 521,290
Int. Cl.³ A01F *12/20*
U.S. Cl. 130—27 T **13 Claims**



1. In an axial flow combine harvester having a mobile frame; a threshing rotor rotatably mounted on said frame for rotation about a generally longitudinally extending axis, said threshing rotor being operable to thresh crop material and separate grain from said crop material, said rotor including a threshing section having mounted thereon a rasp bar for rotation with said rotor; a concave supported on said frame adjacent said threshing rotor for cooperation with said rasp bar to thresh crop material; crop gathering means forwardly mounted on said frame to collect crop material and feed said crop material into said threshing and separating rotor; and drive means for operatively powering said threshing rotor and said crop gathering means, the improvement comprising:

said rasp bar being divided into a plurality of longitudinally extending segments, each said segment being connected to said threshing rotor at a position circumferentially offset relative to the adjacent said rasp bar segment, each said rasp bar segment being spirally curved at least partially around the axis of rotation of said rotor and being positioned in a non-overlapping relationship relative to the axis of said threshing rotor with respect to circumferentially adjacent rasp bar segments.

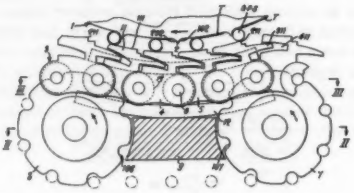
4,505,280

DEVICE FOR WRAPPING A JUNCTION BAND AROUND A PAIR OF CIGARETTES

Athos Cristiani, Bologna, Italy, assignor to Sasib S.p.A., Bologna, Italy

Filed May 20, 1983, Ser. No. 497,070
Claims priority, application Italy, Jun. 2, 1982, 12556 A/82
Int. Cl.³ A24C *5/47*
U.S. Cl. 131—94 **4 Claims**

1. A rolling device for wrapping a glued junction band into position around an axial tern formed of two cigarettes and one double filter interposed therebetween, said terns being orderly ranked on a rotary drum formed of rolling sectors, adapted to cooperate with a co-axial contrasting means capable of engaging said terns sequentially with a relative sliding movement with respect to the drum, so as to make them roll around themselves at least as necessary to make said band wrap up therearound, characterized in that said contrasting means comprises an endless chain-track formed of articulated links, each link including an arcuate rolling sole, said links being positively driven concentrically with the drum along a pre-determined



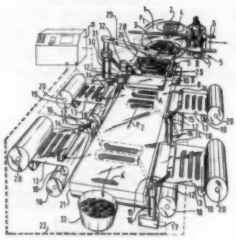
angular extent of the drum, depending upon the wrapping length of said band or sticker, and upon the relative sliding speed between the chain-track and the drum, the constant radial spacing between the soles of the chain-track and the opposite rolling sectors of the drum being just smaller than the diameter of the cigarettes and filter of the tern to be joined, so as to laterally engage the terns by a gentle pressure while they are being rolled to be wrapped by the respective glued junction band.

4,505,281

METHOD AND DEVICE FOR DIVIDING A WHOLE OR A HALF A TOBACCO LEAF INTO USABLE PORTIONS, FOR EXAMPLE, BINDERS OR WRAPPERS

Wilhelmus P. L. Boogers, Eindhoven, Netherlands, assignor to B. V. Arenco P.M.B., Best, Netherlands

Continuation of Ser. No. 162,431, Jun. 24, 1980, abandoned.
This application Jul. 19, 1982, Ser. No. 399,833
Int. Cl.³ A24C *1/04, 1/28*
U.S. Cl. 131—105 **3 Claims**



1. The method of obtaining cigar wrappers from tobacco leaf, which comprises the steps of:

(a) manually placing a whole or half tobacco leaf in spread condition over a group of serially spaced wrapper cutting dies having a number of different sizes or shapes without attention to the correct position of the leaf on said dies whereby one or more of the dies may not be covered with tobacco leaf which is so free of defects or voids as would satisfy a predetermined standard;

(b) cutting wrapper portions from the leaf and then transferring the group of cut wrapper portions onto a longitudinally movable carrier in said serially spaced disposition along the direction of movement of the carrier;

(c) electronically scanning the group of cut wrappers and

determining from data obtained thereby whether each cut wrapper satisfies said standard;

(d) advancing said carrier past a number of bobbin winding stations equal to said number of different sizes or shapes of cutting dies, each station having a web movable transversely away from the direction of movement of said carrier;

(e) transferring cut wrappers satisfying said standard and of a particular size or shape from said carrier onto the web of a station corresponding to such size or shape and moving said webs to space successive cut wrappers thereon; and

(f) traveling cut wrappers which do not meet said standard past said stations to waste.

4,505,282

INNERLINER WRAP FOR SMOKING ARTICLES

Everett C. Cogbill, and Robert S. Sprinkle, III, both of Hopewell, Va., assignors to American Brands, Inc., New York, N.Y.

Continuation of Ser. No. 905,340, May 12, 1978, abandoned, which is a continuation of Ser. No. 720,359, Sep. 3, 1976, abandoned. This application May 10, 1983, Ser. No. 493,287

Int. Cl.³ A24D *1/02, 3/16*

U.S. Cl. 131—334 **13 Claims**

1. An innerliner wrap for a tobacco smoking article comprising a combustible porous paper sheet of cellulosic fibers and finely pulverized activated carbon particles combined intimately with a precipitate of calcium citrate, said carbon particles having a porous surface whereby said calcium citrate is located into and onto said carbon particles to coat both the inner and outer surface.

4,505,283

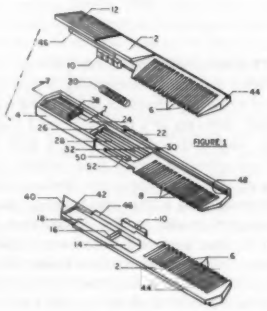
HAIR TRIMMING COMB

Vahan Pischdotchian, 106 Russell Ave., Watertown, Middlesex County, Mass. 02172

Filed Sep. 27, 1982, Ser. No. 423,632

Int. Cl.³ A45D *24/36*

U.S. Cl. 132—45 R **5 Claims**



1. A hair trimming comb in which a pair of mating comb elements are arranged to be translated one within the other, means formed in said elements providing stop positions for the translational movement so as to restrict such movement, partial tooth elements formed in said comb elements to provide mating and complementary teeth, positioning means formed on said elements to readily enable movement thereof, and translational tensioning means arranged between said comb elements to normally urge such elements to translate relative to one another to a closed aligned position.

4,505,284

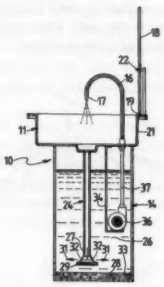
APPARATUS FOR SOLVENT CLEANING MACHINERY PARTS AND THE LIKE AND FOR CLEANING USED SOLVENT

Victor F. Kyatt, Birmingham, Ala., assignor to Hurri-Kleen Corporation, Birmingham, Ala.

Filed Mar. 7, 1983, Ser. No. 472,599

Int. Cl.³ B80B *3/02*

U.S. Cl. 134—104 **5 Claims**



1. Apparatus for solvent cleaning machinery parts and the like comprising:

(a) a washbasin for said machinery parts having a drain in the bottom thereof for discharging used cleaning solvent,

(b) means for dispensing a cleaning solvent into said washbasin,

(c) a fluid-tight container beneath said washbasin for receiving said used cleaning solvent,

(d) an elongated drain pipe communicating at one end with said drain and extending downwardly into the lower portion of said container with the lowermost end of said drain pipe terminating well below the surface of said used cleaning solvent and in spaced relation to the bottom of said container,

(e) a transversely extending deflector member mounted beneath and in spaced relation to said lowermost end of said drain pipe and in spaced relation to the bottom of said container in position to deflect the downwardly flowing used cleaning solvent from said drain pipe horizontally, thus laterally and outwardly relative to said lowermost end to disperse said used cleaning solvent and reduce turbulence, and

(f) means transferring said used cleaning solvent from a location beneath the surface of said used solvent to said means for dispensing said cleaning solvent into said washbasin.

4,505,285

ADJUSTABLY VENTED UMBRELLA

Errol J. French, P.O. Box 1314, Chattanooga, Tenn. 37401

Filed Jul. 19, 1982, Ser. No. 399,714

Int. Cl.³ A45B *11/00*

U.S. Cl. 135—20 R **6 Claims**

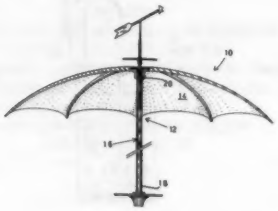
1. An umbrella suitable for being mounted above a surface to be protected while selectively venting air trapped beneath said umbrella, which comprises:

a rigid unitary canopy member having a lower surface directed toward said surface to be protected and an upper surface, said canopy defining a central circular opening and a circular perimeter concentric with said central opening, said upper surface of said canopy member being provided with a plurality of radial grooves extending from said central opening to said perimeter thereby dividing said canopy into a plurality of isosceles triangular sections

each having a base at said perimeter and a truncated apex at said central opening;

a support rod having a first and a further end, said first end adapted for substantial vertical mounting from said surface to be protected;

mounting means proximate said further end of said rod for mounting said canopy concentric with said further end of said rod, said mounting means including a hub mounted on said rod, a ring concentric with said hub attached to said apex of said isosceles sections of said canopy and a plurality of web portions joining said ring to said hub for supporting said ring from said hub and defining air flow passages between said web portions;



an axial extension to said rod at said further end of said rod having a first end connected to said further end of said rod, and a further end;

a rigid unitary disk-shaped cover mounted on, and having a perimeter concentric with, said extension proximate said further end of said extension, said cover proportioned whereby said perimeter of said cover is at a greater radius from said rod than the radius of said central opening of said canopy; and

means for selectively adjusting the spacing between said canopy and said cover to effect selecting the amount of air vented from beneath said canopy through said air flow passages.

4,505,286

PORTABLE SHELTER

Herbert E. Madion, 41329 GlocaMora St., Mt. Clemens, Mich. 48045

Filed May 21, 1984, Ser. No. 612,371

Int. Cl.³ A45B *11/00*

U.S. Cl. 135—90 **5 Claims**

1. A portable personal shelter comprising a sheet of pliable material having a generally semi-circular edge and a linear chordal edge, a hem formed at the generally semi-circular edge, a bowed flexible rod disposed within said hem and having ends projecting from said hem at said substantially linear chordal edge, a chordal member means joining the projecting ends of said rod such as to pull said ends towards each other for forming a semi-conical configuration for said sheet of pliable material with an apex at said linear chordal edge, and means for attaching said apex to a tree trunk or vertical post with said chordal member engaged against said tree trunk or vertical post.

4,505,287

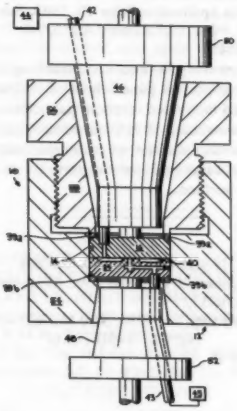
FLOW METERING VALVE

Kenneth L. Blaedel, Dublin, Calif., assignor to United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1983, Ser. No. 548,280

Int. Cl.³ F16K *17/06*

U.S. Cl. 137—12 **16 Claims**



13. A method for metering a fluid, comprising:

providing a valve apparatus comprising a first plate positioned within a housing chamber and formed from a plate material which deforms at a predetermined elastic deformation limit, said first plate including a first plate base surface and an opposing planar face surface including a fluid inlet port, said valve apparatus further comprising a second plate positioned within said housing chamber and formed of material similar to that of said first plate, said second plate having a second plate base surface and an opposing planar recessed face surface defined by a periphery lip and a central lip, said central lip including a fluid outlet port positioned on a planar central lip face surface thereof;

positioning said plates with said central and periphery lips in adjacent contacting relationship with said first plate surface to form a valve chamber and a valve seat wherein said central lip contacts said first place face surface;

applying an external base surface pressure to each of said base surfaces;

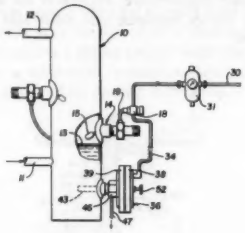
introducing a fluid through said inlet port into said valve chamber; and

pressurizing said valve chamber to a predetermined valve open pressure, causing a deformation of said central lip sufficient as to unseat said valve seat and cause fluid disposed within said valve chamber to exit therefrom through said outlet port.

4,505,288
PNEUMATICALLY CONTROLLED DUMP VALVE SYSTEM FOR GAS SCRUBBERS

Frank W. Murphy, Jr.; Lewis M. Carlton, both of Tulsa; Bob L. O'Mary, Claremore, and Teddy H. Cruse, Broken Arrow, all of Okla., assignors to Frank W. Murphy Manufacturer, Inc., Tulsa, Okla.

Filed Mar. 6, 1984, Ser. No. 586,838
Int. Cl.³ E03B *7/12*; F16K *31/145, 33/00*
U.S. Cl. 137—59 **1 Claim**



1. A liquid dumping system for a gas scrubber operable automatically to maintain a safe liquid level in the scrubber, the system comprising a gas scrubber tank, a diaphragm operated liquid dump valve mounted directly on and threadedly engaged with the side wall of the gas scrubber tank and having a body portion penetrating into said tank and away from the freezing zone externally of the tank to prevent freezing of the dump valve, said dump valve having a diaphragm operated scrubber tank liquid inlet valve element at the interior end of said body portion and having a liquid outlet disposed exteriorly of the scrubber tank, the dump valve also having a pneumatic control chamber disposed exteriorly of the scrubber tank, said dump valve having a vent port means in communication with said pneumatic control chamber, a float operated mechanical vent valve on said side wall of the scrubber tank at an elevation above said dump valve including a liquid level sensing float within the scrubber tank and a dry chamber exteriorly of said tank containing a normally closed vent valve which opens in response to raising on the float when the liquid level in said tank rises beyond a safe level, a diaphragm spool valve separate from and spaced from said vent valve and disposed exteriorly of said tank and having a control air through passage receiving air at a constant positive pressure from a regulated source and adapted to deliver such air at proper times to said pneumatic control chamber of the diaphragm operated liquid dump valve, means forming an air passage between the normally closed vent valve and said control air through passage of the diaphragm spool valve, means forming another air passage between said control air through passage of the diaphragm spool valve and said pneumatic control chamber of the dump valve and being disposed entirely exteriorly of the gas scrubber tank and said float operated mechanical vent valve, whereby the liquid level in said tank returns to a safe level when said float closes said vent valve and allows the control air to be vented from said pneumatic control chamber to atmosphere through said vent port means, and a manual means on said liquid dump valve exteriorly thereof and exteriorly of the gas scrubber tank enabling said dump valve to be operated in a manual mode under emergency conditions.

4,505,289
RUPTURE DISC APPARATUS

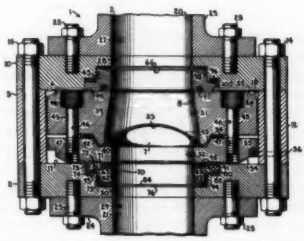
Bryce H. Wilson, Kansas City, Mo., assignor to Continental Disc Corporation, Kansas City, Mo.

Filed Mar. 25, 1983, Ser. No. 478,861
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—68 R **6 Claims**

1. In a replaceable rupture disc cartridge arrangement wherein a cartridge is removably insertable into a fixed receptacle within a vent such that a rupture disc held by the cartridge is operably positioned so as to block passage of fluid through the vent until the disc is broken by overpressure of the fluid within the vent; the arrangement including the cartridge, the receptacle and sealing means for prevention of flow of fluid between the receptacle and the cartridge when the cartridge is operably positioned relative to the vent and further including locking means for substantially securing the cartridge within the receptacle when fluid is pressurized within the vent; the improvement comprising wherein:

(a) said locking means comprises an annular ring circumscribing and positioned adjacent to the vent in a first of said cartridge or said receptacle; said ring having a seat engaging surface on one side thereof, a fluid engaging surface on an opposite side thereof and a channel passing therethrough;

(i) said channel being coaxial with the vent and being defined by an inner cylinder sidewall; said cylindrical sidewall forming a portion of the vent whenever said cartridge arrangement is inserted within said vent; and said cylindrical sidewall having a diameter substantially equivalent to said vent;



(b) a socket positioned in said first of said cartridge or said receptacle and having a general configuration similar to said ring; said socket slidably receiving said ring;

(c) a recessed seat in a second of said cartridge or said receptacle and aligned to generally mate with the seat engaging surface of said ring when the cartridge is in the operational configuration thereof;

(d) biasing means positioned between a biasing means engaging surface of said ring, opposite said seat engaging surface thereof, and said socket, so as to urge said seat engaging surface of said ring into said seat when said cartridge is in the operational configuration thereof; and including

(e) a sealing mechanism positioned between said biasing means and said vent such that fluid from said vent is substantially prevented from wetting said biasing means;

(f) whereby, when said cartridge is in operational configuration thereof and fluid pressure exists within the vent, fluid exerts a force against said fluid receiving surface of the ring so as to bias said seat engaging surface of said ring into said seat, thereby substantially locking said cartridge within said receptacle.

4,505,290
VALVE SEAT ASSEMBLY AND VALVE

William B. Scobie, Houston, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Feb. 3, 1983, Ser. No. 463,410
Int. Cl.³ F16K *1/226*
U.S. Cl. 137—74 **11 Claims**

1. A rotary valve assembly comprising:

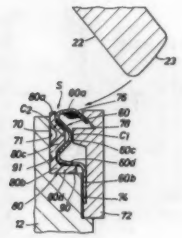
valve body means defining a fluid flowway, said valve body means comprising a body proper and a retainer member secured to one axial side of said body proper, a retaining slot being defined between opposed faces of said body proper and said retainer member, said body proper having

a counterbore in said one axial side of said body proper, axially inwardly of said retaining slot, said counterbore having an axially facing wall;

a valve element disposed in said flowway and rotatably mounted for movement between an open position and a closed position;

a seating assembly carried on said valve body means and circumferentially surrounding said flowway for sealing engagement with said valve element in said closed position, said seating assembly comprising

a metallic seat ring having a radially inner metallic sealing section for sealing engagement with said valve element, a radially outer metallic retaining section received in said retaining slot and clamped between said valve body and said retainer member, and an intermediate metallic spacer section interconnecting said metallic sealing section and said metallic retaining section, said spacer section of said metallic seat ring having a convoluted radial run, said metallic sealing section extending generally axially from said convoluted radial run of said metallic spacer section, said metallic spacer section further comprising an axial run extending from said radial run in generally the same direction as said metallic sealing section, said metallic retaining section extending radially outwardly from said axial run distal said radial run and into said retaining slot;



and a polymeric seat ring contiguous said metallic seat ring and having a radially inner polymeric sealing section for sealing engagement with said valve element, a radially outer polymeric retaining section for mounting said polymeric seat ring in a valve body and an intermediate polymeric spacer section interconnecting said polymeric sealing section and said polymeric retaining section, said spacer section of said polymeric seat ring having a convoluted radial run;

said polymeric retaining section being received in said counterbore, at least a portion of said polymeric retaining section being disposed against said axially facing wall of said counterbore, at least a portion of said radial run of said metallic spacer section of said metallic seat ring being urged against said polymeric retaining section by said retainer member whereby at least a portion of said retaining section of said polymeric seat ring is clamped between said portion of said radial run of said metallic spacer section and said axially facing wall;

said metallic sealing section and said polymeric sealing section being axially displaced with respect to one another.

4,505,291

HEAT SENSITIVE FIRE SAFE VALVE ENERGY ASSIST DEVICE

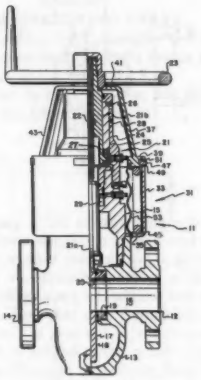
Billy R. Bruton, Longview, Tex., assignor to Axelson, Inc., Longview, Tex.

Filed Aug. 11, 1983, Ser. No. 522,335

Int. Cl.³ F16K *17/40*

U.S. Cl. 137—77 **20 Claims**

1. For use with a fire-safe valve which includes a valve body having a fluid inlet and a fluid outlet with a flowway therebetween, a valving member mounted in said valve body for movement between an open position to allow flow through said flowway and a closed position to prevent flow through said flowway, a stem extending outwardly of said body and operable to move said valving member between said open and closed positions, and heat fusible means for maintaining said stem in a first inward position with respect to said valve body when the temperature around said valve body is less than a predetermined temperature and for allowing said stem to move to a second outward position with respect to said valve body when the temperature around said valve body is greater than said predetermined temperature, apparatus for applying outwardly directed forces between said stem and valve body, which comprises:



a cup mountable exterior of said valve body about said stem and including means for transmitting force to the outside of said valve body;

a pusher mountable about said stem and including means for transmitting force to said stem;

heat releasable means for interlocking said cup and said pusher to prevent axial movement therebetween when the temperature thereabout is less than said predetermined temperature and for allowing axial movement between said cup and pusher when the temperature thereabout is greater than said predetermined temperature;

and means for urging said cup and pusher axially apart.

4,505,292

VALVE FOR ABRASIVE MIXTURES

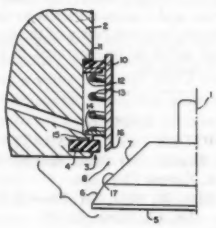
Ulrich Osterode, Neustadt, Fed. Rep. of Germany, assignor to Claudius Peters AG, Fed. Rep. of Germany

Filed Jul. 7, 1983, Ser. No. 511,457

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1982, 3238059

Int. Cl.³ B08B *3/04*

U.S. Cl. 137—240 **3 Claims**



1. A closing arrangement for a conveyor line for an abrasive

mixture containing a solid, comprising: a fluid-tight valve having a valve housing which forms a valve seat and a valve disk located downstream from it, and also comprising a solid-tight auxiliary closing part which acts in the direction of flow in front of said valve and can be closed before said valve in time in order to protect it from said abrasive mixture, characterized in that said auxiliary closing part is formed by a casing which surrounds the valve opening, is located inside said valve seat to protect said valve seat from said abrasive mixture, sealed relative to it and moveable in the direction of the movement of said valve disk, and which assumes an end position when said valve is open in which it extends over said valve seat and spaced therefrom in the direction of flow and from which it can be shifted against a spring means while placing its downstream edge in a solid-tight manner against said valve disk during the last phase of its closing movement.

4,505,293

FLUID FLOW CONTROL VALVE

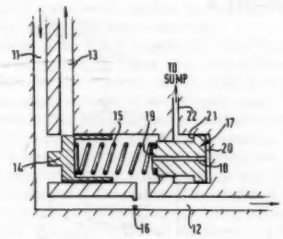
Victor E. Strange, Shirley, England, assignor to BL Technology Limited, United Kingdom

Filed Oct. 6, 1982, Ser. No. 433,010

Claims priority, application United Kingdom, Oct. 10, 1981, 8130665

Int. Cl.[3] **G05D** *16/10*

U.S. Cl. 137—117 **5 Claims**



1. Fluid control valve comprising: a passageway for fluid flow; means for generating a pressure difference proportional to the rate of flow of fluid through said passageway; an outlet for bleeding fluid from a location upstream of said passageway; a first wall member which is movable to vary the flow resistance of said outlet; resilient means for applying a biasing force to said first movable wall member, said first movable wall member also being subject to said pressure difference in opposition to said biasing force, whereby the flow resistance of said outlet is varied to maintain the flow rate through said passageway substantially constant when the static pressure is constant; and a further wall member which is subect over at least part of its area to a pressure difference proportional to the static pressure downstream of said pressure difference generating means, said further wall member acting on said resilient means and being movable under said pressure difference proportional to the static pressure to vary the biasing force on said first movable wall member, whereby the flow rate through said passageway is maintained proportional to the static pressure, wherein said further movable wall member has different areas of each of its faces exposed to static pressure.

4,505,294

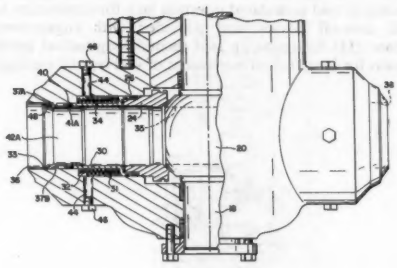
SLURRY VALVE

John F. Walter, Warwick, R.I., assignor to Crosby Valve & Gage Company, Wrentham, Mass.

Continuation of Ser. No. 377,686, May 12, 1982, abandoned, which is a continuation of Ser. No. 169,915, Jul. 17, 1980, abandoned. This application Sep. 30, 1983, Ser. No. 537,543

Int. Cl.[3] **F16K** *3/36*

U.S. Cl. 137—241 **4 Claims**



1. In a valve having a valve body; a valve ball chamber in said body, a valve ball rotatably journaled therein; a spool seat adapted to making sealing engagement with said ball valve; spring means; a spring retainer in axial abutment with said spool seat and adapted to position said spring means in axial compression between said valve body and said spring retainer to urge said spool seat into pressure contact with said valve ball, said spring retainer having an annular skirt extending upstream to fit concentrically within said body, the improvement in means to adapt said valve for use in processing high density substances flowable under high pressures and at elevated temperatures but nonflowable at ambient temperatures, comprising: a flow diverter sleeve adapted to fit concentrically within said spring retainer skirt; a collar on the upstream end of said sleeve, an interior annular shoulder formed in said body downstream from said collar and adapted and located to receive said collar in abutting contact therewith; means to seal the upstream portion of the periphery of said collar with the interior of said body; and means to seal the periphery of said skirt with the interior of said body, whereby flowable substances being processed through said valve are diverted past the upstream edge of said skirt to minimize seepage into and contamination and clogging of said spring means, spring retainer and valve ball chamber.

4,505,295

APPARATUS FOR INSERTING A SHUT-OFF DEVICE LATERALLY INTO A PIPE

René A. Quin, Harskirchen; Paul A. Wiet, Le Chesnay, and Jean-Louis M. Caputi, Paris, all of France, assignors to Compagnie Francaise Des Petroles, Paris, France

Filed Jan. 16, 1984, Ser. No. 571,167

Claims priority, application France, Jan. 26, 1983, 83 1143

Int. Cl.[3] **F16K** *43/00*

U.S. Cl. 137—315 **5 Claims**

1. An insertion apparatus for inserting a shut-off device (9) into a pipe portion (46) via a branch (48) inclined at an obtuse angle to the pipe portion, comprising:

a cylindrical housing (1) having an open rear end and an open front end;

means (2) for closing the rear end of the housing;

fastening means (3) for fastening the housing to the branch at the front end of the housing;

first longitudinal guide means (4) on the housing;

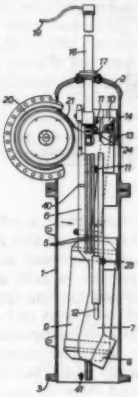
a first elongate carriage (6) comprising a guide member (8) at a front thereof for guiding the shut-off device, and engagement means (5) for engaging said first guide means for longitudinal movement of said first carriage relative to

said housing between a rear position in which said first carriage is contained in said housing, and a forward position in which said guide member is capable of projecting into the pipe portion;

second longitudinal guide means (12) carried by said first carriage;

a forwardly directed, articulated insertion jack (13) connected to the shut-off device and having a retracted position and an extended position;

a second carriage (10) mounted in the first carriage, connected to said articulated insertion jack for connection to said shut-off device, and provided with engagement means (11) for engaging said second longitudinal guide means for longitudinal movement of said second carriage



relative to said first carriage between a rear position in which said insertion jack is in said retracted position and the shut-off device is located on said guide member, and a forward position in which said insertion jack is in said extended position and the shut-off device is moved off said guide member and into said pipe portion;

controlled displacement means (16) for displacing said first carriage in the housing from its rear position to its forward position and for displacing said second carriage relative to said first carriage from its rear position to its forward position;

means for actuating said insertion jack, and means (22) for disconnecting the insertion jack from the shut-off device to enable the withdrawal of the first and second carriages.

4,505,296

FUEL PRESSURE REGULATOR

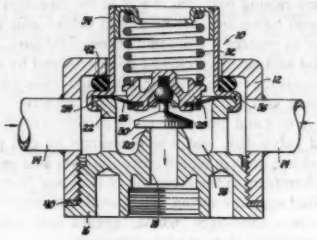
Martin J. Field, Churchville; Andrew J. Makusij, Fairport, and Donald A. Rosin, Penfield, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1984, Ser. No. 622,890

Int. Cl.³ F16K *31/12*

U.S. Cl. 137—510 **1 Claim**

1. A fuel pressure regulator comprising a pressure regulator base having a fuel outlet, a valve seat surrounding said outlet, and an annular mounting rim surrounding said seat, a diaphragm having its perimeter overlying said mounting rim, said diaphragm defining a portion of a fuel pressure chamber and carrying a valve member for controlling fuel flow past said valve seat from said chamber through said outlet, a spring biasing said diaphragm to urge said valve member toward engagement with said valve seat whereby fuel flow past said valve seat through said outlet is controlled to balance the pressure of the fuel in said chamber on said diaphragm with the bias of said spring, a spring housing surrounding said spring and having a flange clamping the perimeter of said diaphragm to said rim, and a fuel supply member surrounding said rim and sealingly engaging said pressure regulator base and said spring housing to define another portion of said fuel pressure chamber, whereby the perimeter of said diaphragm is completely enclosed in said chamber.



4,505,297

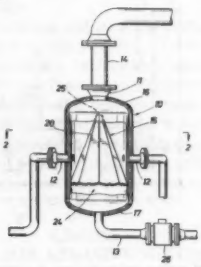
STEAM DISTRIBUTION MANIFOLD

Charles A. Leech, III; Thomas J. Rancudo, Jr., both of Houston, Tex., and James W. Groman, Flagstaff, Ariz., assignors to Shell California Production Inc., Houston, Tex.

Filed Aug. 2, 1983, Ser. No. 519,447

Int. Cl.³ F25B *39/02*

U.S. Cl. 137—561 A **12 Claims**



1. An apparatus for dividing wet steam mixture into a plurality of individual streams while maintaining substantially the same vapor-liquid ratio in each stream, said apparatus comprising:

a closed vertical cylindrical vessel having a central inlet in the top surface, the source of said wet steam being coupled to said inlet;

a plurality of outlets distributed around the side wall of said vessel;

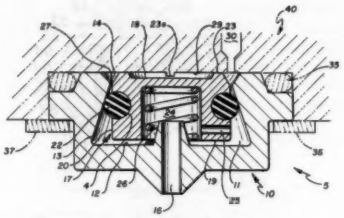
a diverting member, said diverting member having a generally frustum shape, said diverting member being mounted in said closed vessel with the apex of the frustum extending upwardly and the top surface of said diverting member being located above the position of said outlets and the bottom end of the diverting member extending below said outlets; and

an outlet drain located in the bottom of said vessel below the bottom end of the diverting member.

4,505,298
FLUID DISPENSING VALVE ASSEMBLY

Robert Rasmussen, Minneapolis, Minn., assignor to Progressive Assembly Machine Co., Inc., Plymouth, Minn.

Filed Sep. 15, 1983, Ser. No. 532,599
Int. Cl.³ F16K *15/00*
U.S. Cl. 137—540 **15 Claims**



1. A fluid dispensing valve assembly for dispensing a fluid fed to the valve under pressure comprising:

a valve body incorporating a valve chamber having a bottom wall, and a side wall connected to the bottom wall, a portion of the side wall being tapered inwardly as it rises above the bottom wall, such that a portion of the chamber has cross sectional dimensions of progressively decreasing size from the bottom wall towards the top of the chamber to form a valve seat, the valve body also having at least one inlet opening leading to the top of the chamber through which the fluid to be dispensed can enter the chamber, and at least one outlet opening at the bottom of the chamber through which the fluid to be dispensed can exit from the chamber;

a valve poppet located within the chamber adjacent the valve seat and the bottom wall, the poppet having an upper surface and a lower surface and an outer wall intermediate the upper and lower surfaces;

bias means urging the valve poppet towards the top of the chamber and against the valve seat with a force that can be overcome by the pressure of the fluid to be dispensed against the upper surface of the poppet; and

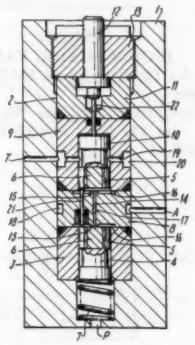
an elastomeric circumferential seal affixed to the outer wall of the valve poppet, the seal having an external dimension sufficiently large for it to sealingly engage the valve seat when the poppet is displaced towards the top of the chamber, the dimension of the seal and the height of the poppet relative to the height of the chamber being selected so that the distance the poppet travels between a valve closed position, whereby the seal engages the valve seat, and a valve fully open position, whereby the force of the bias spring is overcome and the lower surface of the poppet is driven against the bottom wall of the chamber, is substantially less than the height of the chamber.

4,505,299
3-PORT, 2-POSITION DIRECTIONAL CONTROL VALVE

Josef Welzel, and Karl Krieger, both of Wuppertal, Fed. Rep. of Germany, assignors to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Feb. 15, 1983, Ser. No. 466,537
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1982, 3206555
Int. Cl.³ F15B *13/04*
U.S. Cl. 137—596.1 **4 Claims**

1. A 3-port, 2-position, directional control valve comprising a first closure element and a second closure element both movable axially in a central stepped bore of a valve housing for the connection, via fluid flow-paths extending partially along outside surfaces of said closure elements, of a control line to a return flow line and to a high pressure line carrying a pressure medium, a thrust member for exerting a switching force on said first closure element, a pressure pin extending between said first closure element and said second closure element to transmit said force to said second closure element, mutually-facing sealing elements provided in end faces of said closure elements, a manifold member inserted between said closure elements, a centrally-arranged axial bore in said manifold member connected to the control line, and exit openings of said bore at end faces of said manifold member adapted to be sealed alternately

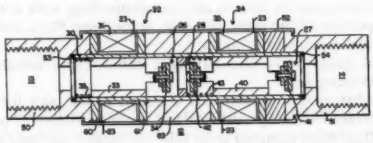


by said sealing elements of said closure elements, said pressure pin being arranged to extend through said manifold member in a non-central bore therein which is substantially parallel to, and eccentrically-offset from, the axial bore in said manifold member and being adapted to be acted on by high pressure medium, said pressure pin being axially-movable in said non-central bore without lateral displacement.

4,505,300
CONTROL VALVE APPARATUS

Thomas S. Jaeger, Crystal, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 1, 1983, Ser. No. 510,032
Int. Cl.³ F16K *31/02*
U.S. Cl. 137—614.14 **3 Claims**



1. Valve apparatus comprising

a non-ferrous tube open at both ends,

at least one wire coil surrounding said tube,

a pair of ferrous metal washers mounted on each side of said coil,

a valve member contained in said tube, guided thereby, and spring biased in one direction in the direction of gas flow against a first valve seating surface,

second seating surface operatively associated with said valve member upstream of said first valve seating surface,

a ferrous metal sleeve surrounding said coil and washers to complete a magnetic path including said valve member and said washers whereby upon energization of said coil said valve member is moved away from said first seating surface against said bias spring to open the valve,

a pair of end connector members adapted for connection to pipes, and

means including said sleeve for connecting said end members to said tube whereby one of said end connecting

members is adapted to be connected to a source of gas under pressure,

said valve member is normally spring biased against said first seating surface to provide a normally closed ON/OFF valve and when said coil is energized said second seating surface provides a modulating valve by moving said valve member toward said second seating surface depending upon the amount of energization of said coil, the spring compression pressure and the gas flow pressure.

4,505,301

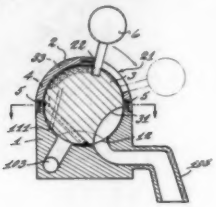
LIQUID MIXING VALVE

Tai-Her Yang, 5-1 Tay Pyng Street, Shi Hwu Jenn, Jang Huah Shiann, Taiwan

Filed Mar. 9, 1982, Ser. No. 356,402

Int. Cl.³ F16K *11/087, 31/02*

U.S. Cl. 137—625.41 **11 Claims**



2. A valve for mixing a first liquid with a second liquid, comprising:

a valve body having a wall shaped so as to define a spherical cavity within said valve body;

said wall having a first orifice therethrough for injecting said first liquid into said cavity;

said wall also having a second orifice therethrough for injecting said second liquid into said cavity, said first and second liquids mixing in said cavity to form a mixture thereof;

said wall also having a third orifice therethrough for discharging said mixture from said cavity;

a spherical guide body rotatably disposed in said spherical cavity, said guide body being formed so as to have a mixing cavity therein and communicating with a variable portion of the areas said first, second and third orifices as said guide body rotates;

said guide body also having a substantially annular slot therein; and

a substantially annular seal disposed in said slot for selectively enclosing said first and second orifices to prevent fluid from escaping from said first orifice and said second orifice.

4,505,302

REPLACEMENT OF MAINS

Roy Streatfield, Bilsborrow, Nr. Preston, and Francis D. Wilson, Blackburn, both of England, assignors to British Gas Corporation, London, England

Division of Ser. No. 326,138, Nov. 30, 1981, abandoned. This application Jan. 21, 1983, Ser. No. 460,005

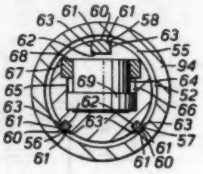
Claims priority, application United Kingdom, Dec. 2, 1980, 8038655

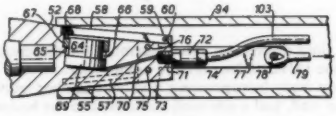
Int. Cl.³ F16L *55/18*

U.S. Cl. 138—97 **10 Claims**

1. A device for replacing or preparing for replacement an existing main with a new main, the device comprising a mole for insertion into and movement along the existing main, the mole having a front portion comprising a head portion provided with a cutting face for engaging the internal wall of the existing main and arranged to cause the wall to fracture and a rear portion provided with means for clamping to the mole the new main or a liner for the bore created by the mole as it moves through the fractured main so that the mole tows the new main or the liner through the fractured main as the mole moves therethrough,

said cutting face comprising a plurality of blades positioned on the head portion to engage and fracture the wall of the





existing main as the mole moves therethrough, all except one of the blades being fixedly mounted on the head portion, said one blade being pivotally mounted on the mole, movable radially outwardly from the mole to engage and fracture the wall of the existing main, and including movable means within the mole to engage said one movable blade to cause it to pivot.

4,505,303

PIPE AND INSULATOR THEREFOR

Peter W. Revere, and Frank Campbell, Jr., both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Apr. 11, 1983, Ser. No. 483,687

Int. Cl.³ F16L *9/10, 9/22;* **F27B** *9/14;* **F27D** *3/02*

U.S. Cl. 138—149 **9 Claims**

1. An insulator assembly for covering a hollow structural member comprising:

a pair of insulator segments,

each of said segments having an internal shape to fit over a portion of the structural member which is to be covered and having straight longitudinal edges and parallel transverse ends,

said segments when placed on the structural member having said longitudinal edges adjacent one another,

at least one of said adjacent longitudinal edges of said segments including a recess,

anchor bands secured in each of said segments and having end tabs extending into said recess, and

said end tabs including notches at a position spaced from their ends, and

a flat retainer having a central opening and a thickness less than the width of said notches, with one dimension of the central opening being larger than the width of said end tabs and with a second dimension of the central opening smaller than the width of said end tabs and slightly larger than the width between said notches,

said retainers being placed over said tab ends in said recesses and rotated to engage in said notches to secure said anchor band end tabs together.

5. An insulator assembly for covering a hollow structural member comprising:

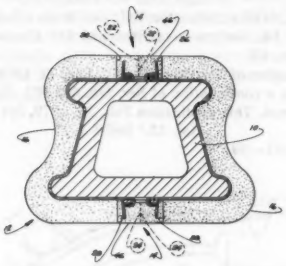
a pair of insulator segments,

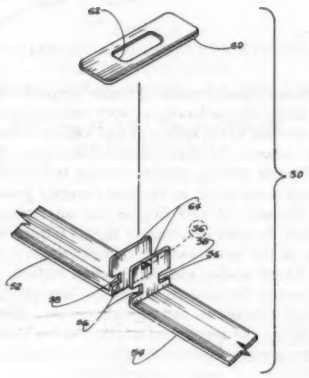
each of said segments having an internal shape to fit over a portion of the structural member which is to be covered and having straight longitudinal edges and parallel transverse ends,

said segments when placed on the structural member having said longitudinal edges adjacent one another,

at least one of said adjacent longitudinal edges of said segments including a recess,

anchor bands secured in each of said segments and having end tabs extending into said recess, and





a T-slot in one end of each of said anchor bands and ears on each side of the other end whereby the ears can be inserted through the wide portion of the T-slot with the band then positioned in the leg of the T-slot and the T-slotted end of the band deformed to retain the engagement between the band ends.

4,505,304

WEFT CUTTING DEVICE FOR A LOOM

John E. Zust, Rt. 1, Seay Rd., Spartanburg, S.C. 29302

Filed Mar. 3, 1983, Ser. No. 471,799
Int. Cl.³ D03D *49/70*
U.S. Cl. 139—302 **16 Claims**

1. A weft yarn cutting device for cutting a waste tape of fabric along a selvage of the fabric which is being woven on a loom comprising:

a base means;

clamp means for clamping said base means to said loom;

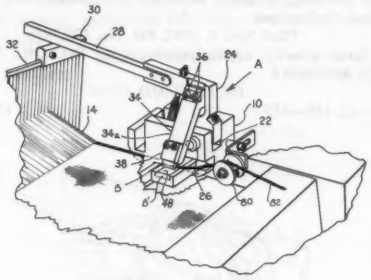
a blade carrier assembly carried by said base means;

a cutting blade element for cutting said fabric;

blade holding means carried adjacent one end of said blade carrier assembly for removably affixing said cutting blade element to said blade carrier assembly;

said blade element including a plurality of interchangeable cutting edges which may be individually selected and held by said blade holding means in a cutting position so that said cutting edges of said blade element may be interchanged on said blade carrier assembly for replacement of a dull edge;

a cutting counterpart carried by said base means having a complementary cutting surface over which said fabric passes for cutting, said cutting edge which is held by said blade holding means in said cutting position striking said



complementary cutting surface to facilitate said cutting; and

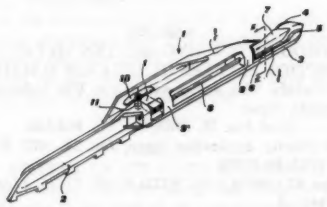
means for imparting a reciprocating cutting motion to said blade element against said cutting surface to cut said fabric therebetween.

4,505,305

CARRYING GRIPPER FOR LOOMS

Nello Pezzoli, Leffe, Italy, assignor to Vamatex S.p.A., Villa di Serio, Italy

Filed May 11, 1982, Ser. No. 377,258
Claims priority, application Italy, May 15, 1981, 21736 A/81
Int. Cl.³ D03D *47/22*
U.S. Cl. 139—448 **1 Claim**



1. A carrying gripper for shuttleless looms, of the type that picks up a yarn on an insertion stroke from a stationary supply of yarn outside the sheds and releases the yarn within the sheds and returns empty, consisting of an elongated base member with its front end profiled, characterized in that it comprises a retention element constituted by a metal pointed head pivoted on an axis parallel to said member and disposed longitudinally thereto, said metal pointed head being arranged on top of said member and bing adapted to engage said member in order to clamp the weft yarn against it under the action of a spring, which acts through an arm disposed on the side of said axis opposite to the pointed head and on the same side of said axis from which the weft yarn is fed, said head extending downwardly and laterally outwardly to said opposite side, said head extending downwardly a greater distance than it extends laterally outwardly when said head engages said member, said metal pointed head being carried by a pin disposed along said axis and rotatably supported by two upwardly projecting blocks of the base member, said pin carrying at the end opposite to the pointed head said arm, on one side of which acts said spring and on the other side of which can act a member for opening the retention element in a non-retaining position.

4,505,306

AIR DISTRIBUTOR AND CONTROL UNIT FOR A JET INSERTION WEAVING MACHINE

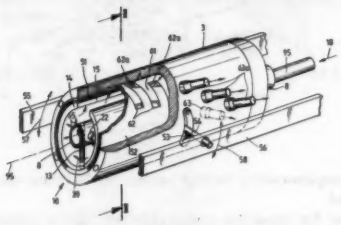
Paul Lincke, Zell, Switzerland; Oswin Kohlhaas, Herzogenrath-Kohlscheid, and Adnan Wahhoud, Aachen, both of Fed. Rep. of Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 8, 1982, Ser. No. 439,787

Claims priority, application European Pat. Off., Nov. 25, 1981, 81810468.9

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 17 Claims



1. An air distributor and control unit for at least one nozzle of a jet insertion weaving machine, said unit comprising:

a stator having a port for communication with the nozzle;

a chamber to receive a pressurized flowable medium;

a rotor rotatably mounted within said stator and having an opening to periodically communicate said chamber with said port; and

means adjustably mounted between said rotor and said stator to adjust the time of communication between said chamber and said port during rotation of said rotor for controlling the supply of medium from said chamber through said port.

4,505,307

METHOD OF POURING MOLTEN METAL INTO INJECTION SLEEVES OF DIE CAST MACHINES

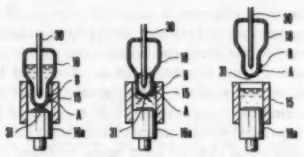
Masashi Uchida, Ube, Japan, assignor to Ube Industries, Ltd., Yamaguchi, Japan

Filed Jun. 28, 1983, Ser. No. 508,810

Claims priority, application Japan, Jun. 29, 1982, 57-110811; Feb. 22, 1983, 58-26971

Int. Cl.³ B65B *3/04;* B22D *17/08, 17/30, 17/32*

U.S. Cl. 141—1 11 Claims



1. A method of pouring molten metal for a die cast machine including a ladle having a molten metal discharge port at the bottom and an injection sleeve, the method comprising the steps of:

pouring molten metal into said ladle while said port is closed;

inserting a bottom portion of said ladle into a lower portion of said injection sleeve;

opening said port to commence to discharge the molten metal in said ladle into said injection sleeve;

continuously raising said ladle while continuously discharging the molten metal therein into said injection sleeve; and

raising said ladle out of said injection sleeve when the level of the molten metal in said injection sleeve rises to a level higher than said port.

4,505,308

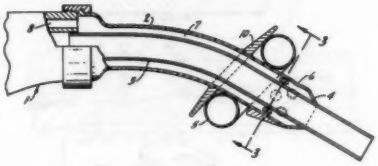
SEALING DEVICE FOR LIQUID DISPENSING NOZZLES WHICH RECOVER VAPOR HAVING CONDUIT INTERNAL TO FILLPIPE

Donald C. Walker, Munster, Ind., and Irwin Ginsburgh, Morton Grove, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 879,761, Feb. 21, 1978, abandoned, which is a continuation of Ser. No. 642,582, Dec. 19, 1975, abandoned. This application Feb. 23, 1979, Ser. No. 14,295

Int. Cl.³ B65B *3/18*

U.S. Cl. 141—59 8 Claims



1. A curved liquid dispensing nozzle adapted for misaligned insertion into a fillpipe having a vapor recovery conduit means which is internal to the mouth of said fillpipe when the nozzle is inserted wherein the improvement comprises a three-dimensionally flexible sealing member having the curvature of approximately torus shape, an external diameter greater than the external diameter of said fillpipe and an internal diameter smaller than the internal diameter of said fillpipe whereby the curvature in the inner and the outer periphery of the torus provides lateral sealing and deformation surface, said sealing member having the capacity for elastic nonuniform deformation in three dimensions and providing a seal from the atmosphere between the misaligned nozzle and the abutting mouth of the fillpipe when said nozzle is inserted therein.

4,505,309

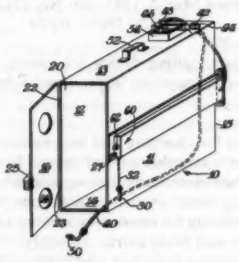
TIRE INFLATION

Robert W. Adelman, and Daniel W. Blevins, both of Wilmington, Del., assignors to The Crowell Corporation, Newport, Del.

Continuation of Ser. No. 287,556, Jul. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 264,196, May 15, 1981, Pat. No. 4,410,021. This application Jul. 18, 1983, Ser. No. 514,533

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—97 5 Claims



1. A tire-inflating apparatus having an enclosure for receiving a tire-and-wheel-rim assembly to be inflated, said enclosure including a door movable between open and closed positions,

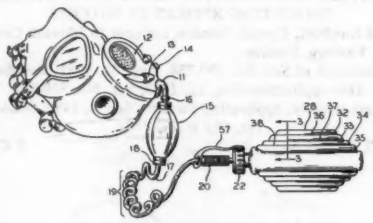
compressed-air-actuated locking means fitted to the enclosure to lock the door in closed position when the door is closed and the locking means is actuated so that the received assembly cannot then be removed from the enclosure until the locking means is unlocked, compressed air means including an air conduit connected to supply compressed air to the tire of the assembly while the assembly is in the enclosure, and control means connected to actuate the compressed air means to inflate the tire and to also automatically actuate the locking means to lock the door in the closed position for a predetermined time beyond the inflation danger time, the control means being further connected to unlock the door after the expiration of said predetermined time.

4,505,310

LIQUID STORAGE AND DELIVERY SYSTEM FOR PROTECTIVE MASK

Wesley Schneider, 1030 N. State St., Apt. 50-F, Chicago, Ill. 60610

Filed Jan. 31, 1983, Ser. No. 462,614
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—114 **26 Claims**



14. System for delivering liquid to a protective mask, said mask of the type having a drinking mouthpiece assembly on the interior thereof positionable at the mouth of a user for ingestion of said liquid, and an inlet tube liquid-tightly attached to said mouthpiece and extending outside said mask, said system comprising:

a hand pump, the outlet of which is liquid-tightly attachable to said pump inlet tube;

a supply tube liquid-tightly attached to the inlet of said pump;

a plug assembly liquid-tightly attached to said supply tube;

a canteen assembly including means for storing a quantity of said liquid therewithin,

said canteen assembly including means for coupling said assembly liquid-tightly thereto;

means for draining said canteen assembly, said drain means liquid-tightly attached to said coupling means and disposed within said liquid storage means,

said liquid storage means, said drain means, said coupling, said plug, said supply tube, said pump, said inlet tube and said mouthpiece defining a liquid flowpath through which liquid may be withdrawn from said storage means; and

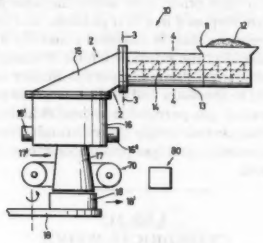
means for compensating for the difference in pressure between the interior of said storage means and atmospheric pressure without exposing said liquid to the atmosphere.

4,505,311

MACHINE FOR DOSING, FILLING AND PACKAGING OF A DOUGHY OR PASTY FOOD SUBSTANCE

Erhardt Krämer, Ratingen; Dieter Möller, Haan, and Ralph Brauer, Ratingen, all of Fed. Rep. of Germany, assignors to Benz & Hilgers GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,638
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212292
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—129 **7 Claims**



1. An improved machine for dosing, filling, and packaging of a doughy or pasty food substance, which is transported by at least one screw conveyor from a conveyor trough via a guide channel to a dosing arrangement and therefrom via an adjoining forming channel is fed into at least one packaging container which is thereafter packaged into a larger collecting package, the improvement comprising,

the guide channel being located between the outlet of the conveyor trough and entrance side of the dosing arrangement, said dosing arrangement being located laterally below the conveyor trough, and redirecting the food substance being conveyed;

the forming channel being connected to the outlet of the dosing arrangement;

wherein the cross-sectional size of both guide channel and forming channel increase in a funnel-like or obelisk-like fashion in the direction of feed;

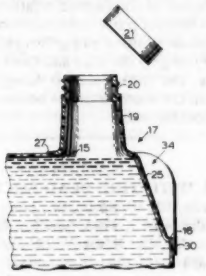
said guide channel being covered with a layer of material having friction reducing properties.

4,505,312

FILLING AN AIR VENTING CLOSURE

George S. Lardner, St. Petersburg, and John S. TenBarge, Indian Rocks Beach, both of Fla., assignors to Halkey-Roberts Corp., St. Petersburg, Fla.

Filed May 4, 1983, Ser. No. 491,418
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—326 **13 Claims**



1. A filling, emptying, and air venting closure for a liquid-containing hollow article having a flexible wall, comprising a hollow stem having a root and a free outer end, a sheet-like member sealingly attached to the root of the stem adapted for sealing engagement to the flexible wall of an inflatable article,

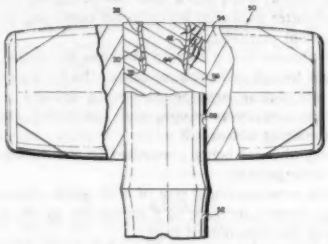
the stem and the sheet-like member being made as an integrally-molded plastic article, the sheet-like member having a perimeter in the form of a flange spaced from and surrounding the root of the stem, said flange being adapted to be sealed to the wall of an inflatable article at an opening therein, said opening being disposed partly in a first, generally flat surface of the inflatable article and partly in a second surface of the inflatable article which is disposed generally at right angles to the first said surface of the inflatable article, the perimeter of the sheet-like member being divided into two major portions which are disposed in planes disposed generally at right angles with respect to each other, both when the stem and the sheet-like member are disposed in a first position, and in their second position wherein the stem is disposed generally at right angles to the axis thereof in the position which it occupies when it is disposed in its first position, and partial closure means removably connected to the outer end of the stem, said partial closure means comprising gas-permeable means which provides for the passage of a gas outwardly therethrough from the interior of the hollow article, said gas-permeable means being impermeable to liquid.

4,505,313

CYLINDRICAL WEDGE

Arnold H. Finn, Farmington, Conn., assignor to Taco Products, Incorporated, Plainville, Conn.

Filed Jan. 25, 1982, Ser. No. 342,177
Int. Cl.³ B25D *1/00*
U.S. Cl. 145—29 R **12 Claims**



6. In combination a tool having a tool head with an eye and a wood handle inserted at one end into the eye in tight-fitting relationship, an improved cylindrical wedge for securing the head firmly on the inserted end of the handle comprising:

a hollow cylindrical body driven coaxially into and substantially embedded in the end of the handle within the eye of the head with the hollow interior portion of the cylindrical body occupied by the wood core of the handle, and a tapered exterior portion of the body spreading the surrounding wood in compressed relationship within the eye, the hollow interior portion also defining a throat section at an intermediate position along the central axis of the cylindrical body to grip the core and firmly hold the wedge in the handle, the throat section being narrower in cross section than the sections of the hollow interior elsewhere along the central axis.

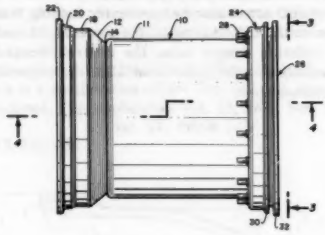
4,505,314

WHEEL WITH TIRE BEAD LOCKING RING

Richard A. Goudy, 101 W. Spring St., Long Beach, Calif. 90806

Filed Apr. 7, 1983, Ser. No. 482,850
Int. Cl.³ B60B *25/12, 25/20*
U.S. Cl. 152—398 **6 Claims**

1. A wheel for mounting a tubeless tire having two sidewalls and a pair of beads possessing the property of limited deformability to conform to a rigid surface that makes a sealing contact with them, said wheel comprising: a hub having a central axis; bead locking ring means mounted on at least one end of said hub means, said bead locking ring means having a flange with a peripheral lip, a radial annulus and a surface of revolution parallel to said axis constructed to receive and extend beyond said bead, said surface of revolution constructed to seal said bead when said bead abuts said lip; a flange on at least one end of said hub having a peripheral lip and a surface of revolution parallel to said axis terminating in a radial annulus substantially identical to the surface of revolution a



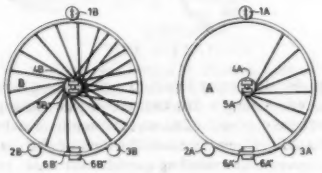
radial annulus on said bead locking ring means to that said bead locking ring means and said flange on said hub mate in a close tolerance fit with and reinforce the surface of revolution and radial annulus on said bead locking ring means; mounting means mounting said bead locking ring means with said bead clamped between the peripheral lips on said flange and said bead locking ring means whereby said tire is sealingly mounted and securely clamped to said wheel.

4,505,315

METHOD AND A DEVICE FOR AUTOMATICALLY MOUNTING SPOKES IN WHEELS

Roland Kaufeldt, Tyresö, Sweden, assignor to Monark-Crescent AB, Varberg, Sweden

Continuation of Ser. No. 297,758, Aug. 31, 1981, abandoned.
This application Dec. 12, 1983, Ser. No. 559,850
Claims priority, application Sweden, Sep. 4, 1980, 8006194
Int. Cl.³ B21K *1/34*
U.S. Cl. 157—1.5 **7 Claims**



1. A method of mounting spokes on and completing a spoke wheel for a bicycle, said method comprising the steps of:

(a) positioning a hub of a bicycle wheel with its axle shaft ends extending horizontal and its flanges extending vertical, spoke apertures being formed in the flanges in predetermined rotational positions such that if two individual spokes are introduced into each of the lower most apertures of one of said flanges with the spoke head adjacent the respective flange containing the aperture, the spokes hang downwardly in substantially a vertical position under the force of gravity,

(b) positioning a bicycle wheel rim in a vertical plane with said hub located in the radial center of said rim and with two spoke apertures of said rim located at substantially the lower most part of the wheel in said vertical plane,

(c) automatically introducing two individual spokes from the outside of said hub into each of the lower most apertures of said hub flanges to the extent that a head of the spoke is adjacent the respective hub flange whereby said

spokes hang in a substantially vertical position with their free ends extending toward the lower most apertures of the wheel rim,

(d) automatically securing each of said two spokes over an individual one of said lower most apertures of the wheel rim,

(e) automatically introducing spoke nipples, said nipples being introduced from the outside of the wheel rim through each one of said two lower most apertures of the wheel rim for making engagements with individually associated ends of said spokes and for automatically threading said spoke nipples onto said spokes,

(f) simultaneously indexing by a uniform angular displacement both the hub and wheel rim to skip one pair of apertures in the hub flanges and wheel rim, respectively,

(g) automatically repeating the above stated steps (a)–(f) until all spokes of an inner layer have been mounted, and

(h) repeating the entire procedure with regard to all spokes of an outer layer by automatically introducing two individual spokes into each of the lower most apertures of one of the hub flanges, said spokes being introduced from the inside of the respective flange to form a completed wheel.

4,505,316

PROCESS AND APPARATUS FOR PACKING GRANULAR FOUNDRY MATERIALS

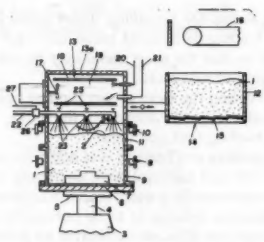
Hans Tanner, Schaffhausen, Switzerland, assignor to George Fischer Ltd., Schaffhausen, Switzerland

Filed Jul. 19, 1982, Ser. No. 399,830

Claims priority, application Switzerland, Jul. 20, 1981, 4740/81

Int. Cl.³ B22C *15/00*

U.S. Cl. 164—37 **5 Claims**



1. A process for compacting granular material, particularly foundry molding sand for forming a casting mold, comprising the steps of:

loosely filling a molding space located between a pattern plate and a molding box with granular material having a predetermined pore volume;

treating by spraying a liquid on selected areas of an upper, exposed surface of the uncompacted granular material to reduce pore volume thereof relative to the predetermined pore volume of lower, adjacent granular material; and thereafter creating a gas pressure wave and directing the gas pressure wave against the treated upper surface of the granular material in a closed system.

4,505,317

PRIME MOVER FOR HOT CHAMBER DIE CASTING MACHINES

Edgar D. Prince, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Jan. 7, 1982, Ser. No. 315,171

Int. Cl.³ B22D *17/04*

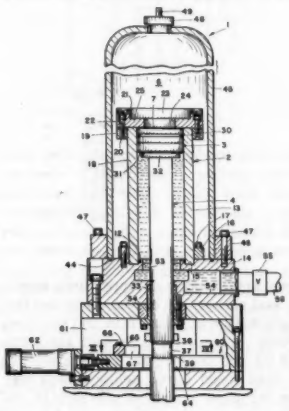
U.S. Cl. 164—153 **22 Claims**

1. In combination with a hot chamber die casting machine of the type having a hot chamber positioned in a basin of molten metal, an inlet port in said hot chamber through which molten metal flows from said basin into said hot chamber, a gooseneck between said hot chamber and a die cavity, and a shot cylinder and plunger mounted within said hot chamber which, through a controlled extension stroke, selectively injects a molten metal from within said hot chamber into said die cavity; an improved prime mover for reciprocating said shot cylinder plunger, comprising:

a cylindrically shaped housing mounted adjacent to said hot chamber;

a piston slideably mounted in said housing, and having a power side and a return side; a rod having one end connected with the return side of said piston and the other end operably connected with said shot cylinder plunger for cyclically and selectively moving said shot cylinder between extended and retracted positions between which a shot stroke is defined;

a closed reservoir retaining high pressure gas therein; said reservoir communicating with the power side of said



piston for urging the same toward the extended position, and having a volume sized sufficiently large with respect to the volume displaced by said piston during the shot stroke that the force acting on the power side of said piston is substantially constant throughout the shot stroke to accurately control the injection of said die cavity;

means for returning said piston to the retracted position after injection of molten metal into said die cavity;

means for selectively retaining said piston in the retracted position while molten metal flows from said basin into said hot chamber to recharge said shot cylinder; and

means for releasing said piston retaining means after said shot cylinder is filled with molten metal, whereby the high pressure gas contained in said reservoir quickly accelerates said piston to a fast speed portion of the shot stroke, and also facilitates substantially instantaneous deceleration of said piston at the end of the shot stroke without substantial backlash.

4,505,318

VERTICAL TYPE PRESSURE CASTING METHOD

Masaaki Tokui; Toshika Masaoka, and Atsushi Ota, all of Toyota, Japan, assignors to Toyoto Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 4, 1982, Ser. No. 384,949

Int. Cl.³ B22D *17/00*

U.S. Cl. 164—113 **3 Claims**

1. A vertical type pressure casting method utilizing a mold with a first and second mold member, at least one cavity formed in the mold, at least one sleeve portion formed in the

mold, a movable plunger movable within said sleeve and having a tip, a counter-tip movable within said sleeve and gate means interconnecting said at least one cavity and said sleeve, which comprises:

clamping said first and second mold members together to form said mold;

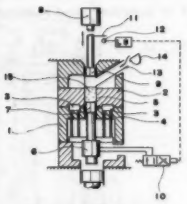
closing said gate means with said counter-tip;

pouring a melt into said sleeve with said plunger tip being located in said sleeve in a lifted state;

displacing said counter-tip and opening said gate means so as to allow the melt to flow into said at least one cavity via said gate means by force of gravity;

pressurizing the melt in said sleeve by moving said plunger tip downward to fill said cavities with said melt wherein said displacing of said counter-tip and opening of said gate means further comprises opening said gate means by said counter-tip after said plunger has started moving downward; and

controlling the speed of said plunger tip during the period of time from commencement of downward movement thereof to opening of said gate means to a level between



an upper limit level in an upper limit speed curve above which said plunger tip moves down too fast and reaches an upper surface of the melt in said sleeve to start a pressure-filling operation before said gate means has been opened by said counter-tip, and a lower limit level in a lower limit speed curve below which said plunger tip reaches the upper surface of said melt in said sleeve after said gate means has been fully opened by said counter-tip allowing said melt to flow into said at least one cavity by the force of gravity alone until the flow of said melt has stopped so as to control the rate of flow of melt into said at least one cavity in such a manner that a ratio of the volume of products to the cross-sectional area of said gate means is 20–40 such that the percentage of melt flowing into said at least one cavity by the force of gravity alone is not less than 30 percent, the percentage of melt fed into said at least one cavity by the force of gravity at a time when said plunger tip reaches the melt in said sleeve is 30–70 percent, and the speed of melt flowing through said at least one gate during the pressure-filling of said at least one cavity by said plunger tip is 0.4–0.8 m/sec.

4,505,319

CONTINUOUS SHEET METAL CASTING DEVICE

Tomoaki Kimura, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1982, Ser. No. 352,997

Claims priority, application Japan, Feb. 27, 1981, 56-27029

Int. Cl.³ B22D *11/06*

U.S. Cl. 164—432 **16 Claims**

9. A continuous sheet metal casting device having a mold, which comprises:

a pair of top and bottom flexible endless belts mounted for rotation in a common plane with adjacent parallel runs forming the top and bottom walls of the mold;

means for driving said belts so that their adjacent parallel runs travel at the same speed and in the casting direction along the mold;

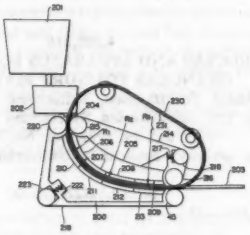
a pair of first side and second side opposed side members, each comprising at least two flexible, completely separate, endless side belts having respective sides that are seamless in said direction for forming the first side and the second side of the mold, and said side belts being mounted for rotation in planes parallel to each other and parallel to the plane of rotation of said top and bottom belts;

said side members being mounted so as to have parallel runs spaced from each other, and said side member parallel runs being between and in contact with each of said top and bottom flexible belts so as to move therewith along the mold and so that the top, bottom, and side belts form the mold as an endless moving rectangular mold having an inlet end and an exit end;

for each of said side members, said side belts being stacked on each other in the direction of their thickness and being in full engagement throughout their length at least along said mold;

a tundish for holding liquid metal;

means for supplying liquid metal into said tundish;



nozzle means for removing liquid metal from said tundish and feeding said liquid metal into said inlet end of said mold so that the sheet metal may be withdrawn from the exit end of said mold;

means cooling the faces of said top and bottom belts that are opposite from the interior of the mold;

means cooling said side belts;

means guiding and bending said side belts adjacent said mold inlet end and said mold exit end along a radius of curvature substantially greater than the adjacent one of said top and bottom belts so as to be outwardly spaced from and envelope the adjacent one belt at all portions except along said mold so that said side belts are substantially of greater length than their adjacent one belt and so that the bending stresses in said side belts as they bend around said curvature may be reduced as compared to a smaller curvature; and

each of said side belts having a width, as measured perpendicular to said direction, that is substantially greater than its thickness.

4,505,320

HORIZONTAL CONTINUOUS CASTING PLANT

Hermann Schubert, Linz, and Heinrich Thöne, Stiedelsbach, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 20, 1982, Ser. No. 419,708

Claims priority, application Austria, Oct. 9, 1981, 4342/81

Int. Cl.³ B22D *11/00*

U.S. Cl. 164—440 **12 Claims**

1. In a horizontal continuous casting plant, in particular for casting steel, of the type including

a base,

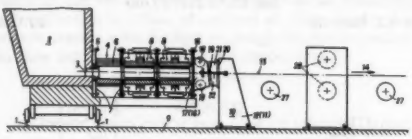
a strand guideway including a stationary, portion supported by said base,

a tundish supported by said base for accommodating a metal melt, said tundish having means for moving said tundish

along said base into a position in alignment with said strand guideway and removable therefrom,

at least one open ends mould fastened to said tundish and defining a mould cavity, and

means for extracting a strand from said mould arranged along said strand guideway, the improvement wherein:



said mould is movable, together with said tundish, into and out of said position in alignment with said strand guideway, and wherein said plant further includes means coupled to said mould and said stationary portion of said strand guideway for fixing said mould relative to said base without play in the longitudinal direction of its cavity when said mould is in said position in alignment with said strand guideway.

4,505,321

METHOD OF, AND APPARATUS FOR, COOLING AND SUPPORTING A STRAND IN A PLATE MOLD OF A CONTINUOUS CASTING INSTALLATION, ESPECIALLY FOR CASTING STEEL STRANDS

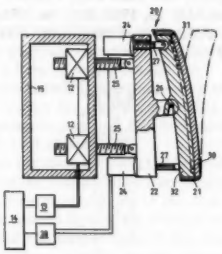
Josef Zeller, Weesen, Switzerland, assignor to Concast Service Union AG, Zurich, Switzerland

Filed Jan. 27, 1983, Ser. No. 461,472

Claims priority, application Switzerland, Feb. 12, 1982, 879/82

Int. Cl.³ B22D *11/04*

U.S. Cl. 164—491 **15 Claims**



1. A method of cooling and supporting a steel strand in a plate mold of a continuous casting installation, in which said plate mold comprises wide side walls and at least one displaceable mold wall having a central axis, said method comprising the steps of:

moving said strand in a predetermined direction of travel;

changing the format of the cast strand by displacing the displaceable mold wall at a given rate of displacement;

calculating an instantaneous geometric shape of a moving solidified shell of the cast strand as a function of said rate of displacement of said mold wall and the velocity of movement of the moving solidified shell; and

applying to said displaceable mold wall, during displacement thereof, a bend corresponding to the instantaneous geometric shape of the moving solidified shell of said strand and which shell is associated with said mold wall.

4,505,322

METHOD OF STORING HEAT AND HEAT STORE FOR CARRYING OUT THE METHOD

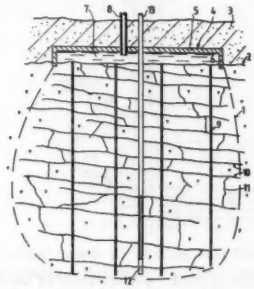
Sven A. Larson, Beckmans väg 54, S-443 00 Lerum, Sweden

Continuation of Ser. No. 212,713, Oct. 30, 1980, abandoned. This application Oct. 31, 1983, Ser. No. 547,446

Claims priority, application Sweden, Mar. 12, 1979, 7902174; Sep. 6, 1979, 7907409

Int. Cl.³ F28D *21/00, 17/00*

U.S. Cl. 165—1 **11 Claims**



1. A method of storing heat in rock comprising forming heat exchanging surfaces in substantially underground rock by forming a plurality of bore holes in said rock, forming heat exchanging surfaces in said rock by forming a plurality of stratum-like rock sections between approximately plane parallel cracks in directions determined by the natural stress state of the rock by applying hydraulic excess pressure at different levels to split up the rock at the different levels, providing transverse channels between said cracks whereby said cracks are connected by a number of transverse channels, and providing at least one production hole in the cracked heat storing rock volume provided, heat the stratum-like rock sections between the cracks by infiltrating hot water into the fissured rock to cause the hot water to follow a plurality of the approximately plane parallel cracks, while drawing off colder water through said production hole, to contact the heat exchanging surfaces in the region of the cracks to heat the rock by exchange of heat from the water to produce a heat reservoir of heated rock, and recovering heat by infiltrating cold water into the heat reservoir of heated rock to heat the water, and withdrawing heated water from the rock.

4,505,323

APPARATUS FOR INSPECTING HEAT EXCHANGER TUBES

Louis de la Pintiere, Guichen, and Jean Ballereau, Paris, both of France, assignors to Intercontrole Société Anonyme, France

Filed May 6, 1983, Ser. No. 492,232

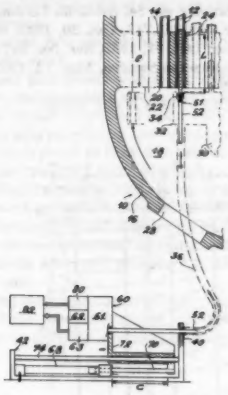
Claims priority, application France, May 7, 1982, 82 07968

Int. Cl.³ F28G *15/02;* F16C *1/12;* F16G *9/00*

U.S. Cl. 165—11 A **8 Claims**

1. An apparatus for checking the tubes of a heat exchanger in an area spaced by a given distance from the end of said tubes, by means of a probe performing a helical movement, wherein the apparatus comprises a threaded rod, which can be screwed into a nut carried by a positioning and supporting device suspended on the exchanger tubes, first flexible means, which are perfectly rigid in torsion and of constant length ensuring the integral transmission of a rotation torque between the threaded rod and the probe, second flexible means ensuring the integral transmission of said rotation torque between rotation control means and the threaded rod, a flexible sheath connecting the nut and a fixed chassis external of the exchanger, and means for sliding the assembly constituted by the probe, the first flexible

means, the threaded rod and the second flexible means between a rest position in which the probe is placed in the said nut, level



with the latter so as to permit displacement of said device, and an inspection position in which the threaded rod engages in the nut.

4,505,324

SLIDER CONTROL

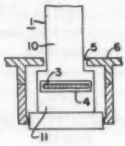
Reinhard Hildebrand, and Bernd Waldmann, both of Redwitz, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 24, 1983, Ser. No. 478,345

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211271

Int. Cl.³ H01H *9/04;* **G05G** *1/02*

U.S. Cl. 165—42 **1 Claim**



1. In a slider control of a heating and ventilating system of an automotive vehicle having a passenger compartment and a control panel facing thereinto, said control panel being provided with a slot, said slider control comprising an actuating lever traversing said slot for enabling adjustment of the operating state of said heating and ventilating system, the improvement comprising:

a web disposed on a side of the slot opposite the passenger compartment and having a continuous portion at least coextensive with said slot and stationary with respect to the control panel; and

an enlarged portion of the actuating lever disposed on a side of said slot opposite said passenger compartment and provided with an opening traversed by said web, said enlarged portion being broader than said web and said slot.

4,505,325

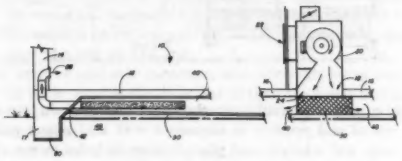
AIR CIRCULATION SYSTEM FOR GENERALLY ENCLOSED STRUCTURES

Hervin J. Bergeron, Jr., Opelousas, La., assignor to Stephen J. Ledet, Jr., St. Landry Parish, La. and James Donald Elder, Calcasieu Parish, both of, La., part interest to each

Filed Jul. 3, 1979, Ser. No. 54,659

Int. Cl.³ F28D *17/00*

U.S. Cl. 165—45 **30 Claims**



1. An air circulation system for generally enclosed structures, as a home, having an interior space defined in part by a slab/floor, said system comprising:

a. a structurally supportive lightweight aggregate mass subsurface to the slab/floor and structurally communicating with ground support thereunder, said mass forming a structural support for at least a portion of the slab/floor and defining an enlarged void air space between said slab/floor and the underlying ground support;

b. blower means for circulating air between interior space and said void air space;

c. film sheet enveloping said mass for preventing water flow into said mass from the surrounding area; and

return air flow conduit means for carrying air from said void air space to said interior space.

4,505,326

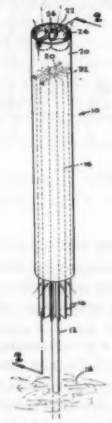
HEAT PIPES WITH SHROUDED FINS AND FAN

Craig B. Hazen, Irvine, Calif., assignor to Northwest Alaskan Pipeline Company, Salt Lake City, Utah

Filed May 13, 1983, Ser. No. 494,416

Int. Cl.³ F25D *1/00;* **F28D** *15/00;* **F28F** *13/12*

U.S. Cl. 165—45 **10 Claims**



1. In a soil freezing apparatus including a generally vertically oriented heat pipe having a lower end capable of being embedded in the earth and an upper end provided with heat exchange fins for conducting heat from the pipe to the atmosphere, the improvement comprising open-ended shroud

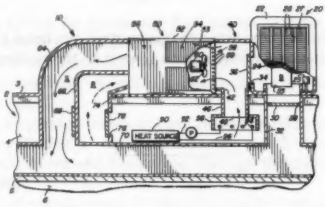
means comprising a tubular cylindrical pipe concentrically positioned over the upper end of said heat pipe and fittable over said heat exchange fins for enclosing same and wherein said shroud means is removably supported on said fins and can be axially lifted from said heat pipe fins and said heat pipe, stop means positioned internally of said shroud for engagement with said fins for limiting downward movement of said shroud relative to said fins and electric motor driven fan means operable for effecting the flow of ambient air through the shroud means in contact with the heat exchange fins for increasing the heat flow rate from the fins to the atmosphere.

4,505,327

HEATING AND COOLING APPARATUS HAVING EVAPORATIVE COOLER AND HEAT PUMP

Lonnie L. Angle, 2207 E. McDowell Rd., Mesa, Ariz. 85203, and John R. Roberts, Jr., Glendale, Ariz., assignors to Lonnie L. Angle, Mesa, Ariz.

Filed Apr. 9, 1981, Ser. No. 252,402
Int. Cl.³ F25B *25/00*
U.S. Cl. 165—48 R **17 Claims**



13. Heat pump and evaporative cooling apparatus, comprising, in combination:

heat pump means having a cooling mode for providing a first flow of air in which cooling is accomplished by an evaporator which receives liquid refrigerant at high pressure condenser coils;

a second flow of air flowing over the condenser coils for removing heat from the condenser coils;

cooler means disposed adjacent to the heat pump means for providing a flow of water cooled air;

duct means connected to the heat pump evaporator and to the cooler means for receiving the first flow of air from the heat pump means and the flow of water cooled air from the cooler means; and

damper means for disconnecting the flow of water cooled air from the cooler means to the duct means, for connecting the flow of water cooled air to the heat pump means for cooling the second flow of air through the condenser coils for lowering the temperature of the condenser coils, including interface adapter means disposed between and connecting the cooler means and the heat pump means through which the water cooled air flows directly to the condenser coils from the cooler means, and for preventing the flow of water cooled air from the duct means to the heat pump evaporator means.

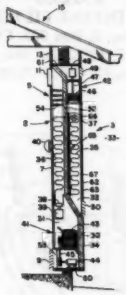
4,505,328

SYSTEM FOR CONDITIONING AIR

Robert F. Schmitt, 399 Grossbrook Dr., Berea, Ohio 44017

Filed Dec. 13, 1978, Ser. No. 969,074
Int. Cl.³ F24D *15/00*
U.S. Cl. 165—53 **9 Claims**

1. A system for heating the air of an area of a building, comprising a refrigeration heating unit, including an evaporation coil, a condensation coil, an expansion valve, a compressor, and a working fluid, thermal insulation means for separating at least a substantial portion of said evaporation coil from said condensation coil, the former and latter being positioned in air flow communication, respectively, with air exteriorly and with air inside of such building as separated by said thermal insulation means, blower means for blowing air from within such area along a flow path across said condensation coil to be heated thereby and into such area for heating the



same, and motor means for driving said blower means, said motor means being positioned on a side of said thermal insulation means in exposure to air from within such area whereby heat developed by said motor means is transmitted to air in such flow path.

4,505,329

HEAT EXCHANGER

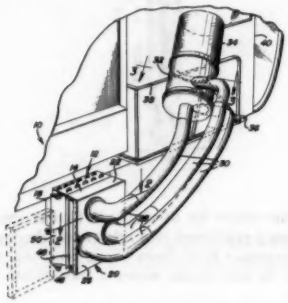
Thong Nguyen-Thanh, Cernay-la-Ville, France, assignor to Commissariat a l'Energie Atomique, Paris and Stein Industrie, Velizy Villacoublay, both of, France

Filed Jan. 7, 1982, Ser. No. 337,759
Claims priority, application France, Jan. 13, 1981, 81 00455
Int. Cl.³ F28F *7/00*
U.S. Cl. 165—81 **11 Claims**

1. A heat exchanger device comprising an outer ferrule closed at its ends by two tube plates, a group of tubes provided with expansion bends, said tubes being connected to the tube plates to issue into inlet and outlet collectors for a fluid circulating within the tubes and inlet and outlet pipes for a liquid circulating in the ferrule and around the tubes, wherein the expansion bends are positioned in contact with the liquid in the coldest area of the exchanger, and wherein means are provided for deflecting at least part of the liquid flow at the expansion bends, in order that said liquid cannot cause the latter to vibrate, wherein the means for deflecting at least part of the liquid flow comprise a jacket located within the outer ferrule

and in which are placed the expansion bends and at least one orifice made in said jacket upstream of the expansion bends in order to deflect at least part of the liquid flow between the inner jacket and the outer ferrule.

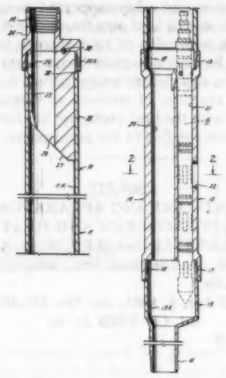
4,505,330
RADIATOR AIR INTAKE FILTERING SYSTEM
Richard W. Sherman, Rte. 2, Box 303, Chillicothe, Tex. 79225
Filed Jul. 7, 1983, Ser. No. 512,107
Int. Cl.³ F01P 7/10
U.S. Cl. 165—119 **8 Claims**



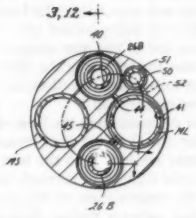
1. In combination with an apparatus at least occasionally operative in a dust or trash laden atmosphere, including a liquid cooled combustion engine as a power source and wherein cooling liquid from the engine is passed through a heat transfer assembly in the form of an air cooled radiator including air intake and exhaust sides, an air cleaner for said radiator including a hollow housing having one open side in substantially sealed communication with the intake side of said radiator, said housing including a second side remote from said one side defining air inlet means for said housing, said housing including interior air filter means therein for filtering air passing through said housing from said air inlet means to said open side, air duct means having inlet and outlet ends, said outlet end being sealingly communicated with said air inlet means, said inlet end opening into a hollow air intake structure, said hollow air intake structure including an open side having primary air filtering means operatively associated therewith.

4,505,331
SIDE POCKET MANDREL
Neil H. Akkerman, Houston, Tex., assignor to AVA International Corporation, Houston, Tex.
Filed Nov. 8, 1982, Ser. No. 440,071
Int. Cl.³ E21B 23/03
U.S. Cl. 166—117.5 **5 Claims**

4. A side pocket mandrel, comprising upper and lower, non-welded sections having openings therethrough whose upper and lower ends, respectively, are adapted to be connected in substantial axial alignment with a well pipe string, and whose lower and upper ends, respectively, are coaxial with one another but eccentric with respect to the axes of their upper and lower ends, and an intermediate, non-welded section comprising a body whose upper end is threadedly connected to the lower end of the upper section and whose lower end forms a cylindrical continuation of the upper end of the lower section, said body having a first bore formed therein which is substantially axially aligned with the upper and lower ends of the upper and lower sections, respectively, to permit well tools to pass therethrough, and a second bore formed therein which is parallel to the first bore and open on at least one end to provide a pocket into which a flow-controlling tool may be inserted or from which a flow-controlling tool may be removed and means in the upper section having orienting means which, when the upper and intermediate sections are threadedly and sealably connected to one another, occupies a predetermined rotational position with respect to the pocket.



4,505,332
WELL PACKERS
Aubrey C. Mills, and Neil H. Akkerman, both of Houston, Tex., assignors to AVA International Corporation, Houston, Tex.
Filed Oct. 21, 1982, Ser. No. 435,675
Int. Cl.³ E21B 23/00
U.S. Cl. 166—120 **26 Claims**



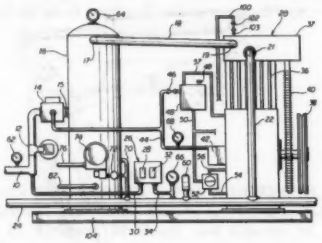
1. A multiple well string packer, comprising body means disposable within a well bore, a packing element supported by the body means, a slip assembly carried about the body means, a pair of mandrels each adapted to be connected in a well string and extending vertically within the body means closely through side-by-side holes within the packing element, means for supporting said body means from one of the mandrels to permit the body means to be lowered therewith into the well bore, said body means including fluid-actuated means for causing the slip assembly to be moved into gripping engagement with the well bore and the packing element to be moved into sealing engagement with the well bore, when said packer has been lowered with said strings into a desired position within the well bore, and the other mandrel being movable vertically with respect to the body means to permit relative vertical movement between said strings during lowering of said packer into the well bore.

4,505,333

METHODS OF AND MEANS FOR LOW VOLUME WELLHEAD COMPRESSION HYDROCARBON GAS

Tom E. Ricks, Sr., 4306 Durango, Odessa, Tex. 79762

Filed Sep. 2, 1981, Ser. No. 298,882
Int. Cl.³ E21B *43/00, 43/34*
U.S. Cl. 166—267 **9 Claims**



1. A system for producing fluid which includes gas from a hydrocarbon well, comprising:

(a) An inlet manifold connectable to said well;

(b) a discharge manifold connectable to a gas collection system;

(c) compressor means connected to the inlet manifold and the discharge manifold whereby gas from the well is pressurized and discharged through the discharge manifold;

(d) first switch means for deactivating the compressor means when the pressure in the discharge manifold rises above a first predetermined pressure and for permitting activation of the compressor means when the pressure in the discharge manifold drops below a second predetermined pressure, which is less than or equal to said first predetermined pressure; and

(e) second switch means for deactivating the compressor means when the pressure in the inlet manifold drops below a third predetermined pressure and for permitting activation of the compressor means when the pressure in the inlet manifold rises above a fourth predetermined pressure, which is greater than or equal to said third predetermined pressure;

(f) starting means for activating said compressor means when said compressor means is not already activated and when said first and said second switch means both permit activation of said compressor.

4,505,334

BALL SEALER

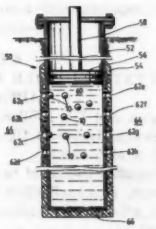
August K. Doner, Elmo; Lewis L. Brady, Plano, and Jesse T. Alvarado, Canton, all of Tex., assignors to Oil States Industries, Inc., Arlington, Tex.

Filed Sep. 6, 1983, Ser. No. 529,951
Int. Cl.³ E21B *33/13*
U.S. Cl. 166—284 **12 Claims**

1. A ball sealer for seating against high flow perforations in oil well casing during fluid injection, comprising:

a spherical core which forms a suitable base on which to wrap a filament; and

a layer of thermosetting filament wrapping outside the core which is sufficiently thick to give the ball sealer the strength necessary to withstand the pressure differential



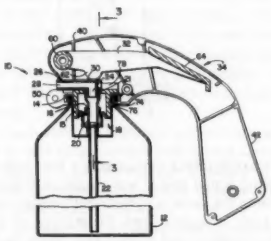
across a perforation in oil well casing during fluid injection.

4,505,335

FIRE EXTINGUISHER HANDLE SECURING APPARATUS

Franklin P. Hayba, Cleveland, Tenn., assignor to ASP International, Inc., Cleveland, Tenn.

Filed Nov. 12, 1982, Ser. No. 440,987
Int. Cl.³ A62C *13/24*
U.S. Cl. 169—76 **11 Claims**



1. In a fire extinguisher having a container for storing an extinguishant under pressure, said container including a closure cap fastened on the top thereof having an annular recess, said cap including valve means normally biased to prevent discharge of extinguishant from the container and through which extinguishant is discharged when the valve is open, an elongated discharge nozzle having a discharge end, a conduit connected to said nozzle spaced from the discharge end for communicating said nozzle with said valve means for communicating extinguishant discharged from said valve means through said nozzle, said conduit being depressable into engagement with said valve means for overcoming the bias and for urging said valve means to open, a handle mounted on said container with a trigger lever pivotably carried integral therewith and having cam means for acting on said nozzle to urge said conduit to open said valve means, the improvement comprising:

a support member disposed in the annular recess of said cap and extending above said cap;

said support member including means interfaced with said

handle to prevent upward movement relative to said support member;

said support member having a base formed therein for allowing said conduit to pass therethrough and interact with said valve means;

a first annular groove defined on a surface of said annular recess and extending radially outwards;

a second annular groove defined on the surface of said support member and extending radially inwards, said second groove disposed such that it is proximate said first groove when said support member is disposed within said annular recess; and

an annular ring formed in the space defined by said first and second groove to prevent upward movement of said support member relative said annular recess.

4,505,336

FIRE EXTINGUISHER AND LIQUID DISPENSING APPARATUS

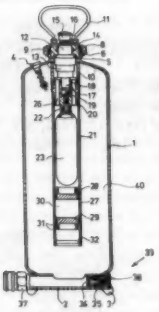
Paul Thevis, and Tilo Möller, both of Oberndorf, Fed. Rep. of Germany, assignors to Heckler & Koch GmbH, Oberndorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 186,300, Sep. 11, 1980, abandoned. This application Feb. 28, 1983, Ser. No. 470,705

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940601

Int. Cl.³ A62C *35/18*

U.S. Cl. 169—85 **28 Claims**



1. A fire extinguisher comprising a first tank for storage of a fire inhibiting liquid under low pressure and having an outlet for dispensing the same, a cylindrical housing supported within said first tank, a second tank for storage of a propellant gas under high pressure, said second tank being located within said first tank and being provided with a pressure reducing valve having an outlet for discharging said propellant gas into said first tank to maintain the low pressure therein, said second tank and said reducing valve being aligned axially and located in said cylindrical housing, a means for storing a parent solution for foaming said fire-inhibiting liquid, said storing means being located within said first tank and having one end communicating with the discharge of said reducing valve and having means for expelling said parent solution from said cylindrical housing on discharge of said propellant gas into said first tank.

4,505,337

PLOW JUMP MECHANISM

John W. Ryan, Botany, Australia, assignor to Agrowparts Pty Ltd., Botany, Australia

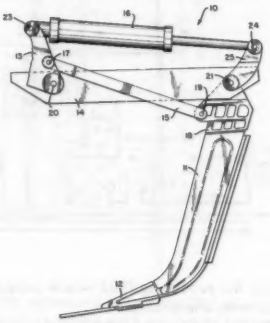
Filed Nov. 5, 1982, Ser. No. 439,061

Claims priority, application Australia, Nov. 10, 1981, PF1497

Int. Cl.³ A01B *61/04*

U.S. Cl. 72—260.5 **5 Claims**

1. A jump mechanism for a plough having a frame to support at least one shank, said mechanism comprising a generally horizontal main draw bar to be pivotally attached at one end to the frame so as to extend rearwardly therefrom and to be pivotally attached at the other end to said shank so that said shank can move relative to said frame by pivotting about two spaced transverse horizontal axes one at each end of said bar, pivot control means to regulate pivoting of said shank about said other end of said bar relative to the pivotting of said bar at



said one end, force supplying means for attachment to said frame and jump mechanism to bias said shank to a predetermined digging position, and wherein said pivot control means is a control bar extending rearwardly downwardly from a forward position above said one end to a rearward position below said other end, said control bar being pivotally attached to said frame at said forward position and pivotally attached to said shank at said rear position.

4,505,338

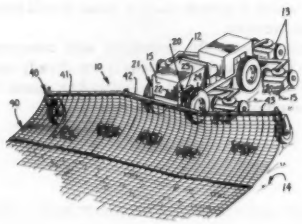
TURF CONDITIONING APPARATUS

Alexander Koval, Endwell, N.Y., and H. Donald Whitlow, Anniston, Ala., assignors to Blue Mountain Industries, Blue Mountain, Ala.

Filed Apr. 22, 1983, Ser. No. 487,806

Int. Cl.³ A01B *31/00*

U.S. Cl. 172—611 **5 Claims**



1. A turf conditioning apparatus for use with a tractor-mower, comprising:

a supporting bar comprising two end sections pivotally attached to a center section so that said end sections may act independently of said center section;

means for securing said supporting bar to said tractor-mower;

a flexible netting suspended from said supporting bar so as to extend therefrom, said netting defining a length from a front portion to a rear portion thereof; and

weight means attached to and extending across the width of said netting in a direction substantially perpendicular to the movement of said turf conditioning apparatus, said weight means being attached to the top of said netting intermediate said front portion and said back portion and

being sufficiently freely flexible across the width of the flexible netting so as to insure engagement of that portion of said netting extending rearwardly of said weight means with an undulating ground surface to be conditioned,

whereby conventional operation of said tractor-mower pulls said netting across the ground surface so that at least that portion of the length of said netting extending rearwardly of said weight means traverses the contour of the ground surface so as to condition said ground surface.

4,505,339

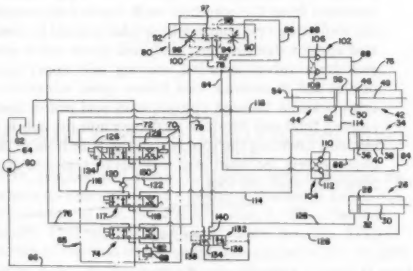
HYDRAULIC CONTROL FOR A DOZER BLADE

Lee F. Kramer, Waukegan; Ronald K. Schantz, Libertyville; Steven C. Kirkham, McHenry, and Charles M. Tschanz, Lindenhurst, all of Ill., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 125,397, Feb. 27, 1980, abandoned. This application Jun. 14, 1982, Ser. No. 388,569

Int. Cl.[3] **E02F** *3/76;* **F16B** *11/00*

U.S. Cl. 172—812 **4 Claims**



1. Apparatus for controlling a dozer blade mounted on a pair of push arms comprising:

a pair of pitch rams connected respectively between said blade and said push arms for parallel actuation;

a diverter-combiner valve having an input port and two output ports in parallel communication respectively with first ends of said rams for assuring equal rates of fluid flow to and from said first ends of said rams, said output ports of said diverter-combiner valve being capable of communicating with each other through said valve;

a pitch control valve having a first outlet communicating with said diverter-combiner valve input port and a second outlet in simultaneous fluid communication with the parallel second ends of said pitch rams and disposed to selectively supply pressure to either outlet while draining fluid from the other outlet; and

pilot operated check valves connected between the diverter-combiner valve output ports and said first ends of said rams and between said pitch valve outlet and second ends of said rams and disposed to prevent fluid communication between said first ends of said rams and also between said second ends of said rams in the absence of pressure from said pitch valve;

a tilt ram connected between one of said pitch rams and its push arm; and

a tilt valve connected to selectively direct pressure to one end of said tilt ram while simultaneously exhausting fluid from the other end.

4,505,340

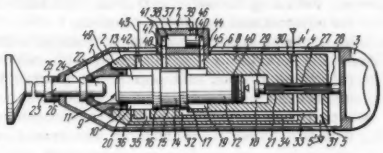
HYDROPNEUMATIC PERCUSSIVE TOOL

Ivan A. Yantsen, bulvar Mira, 40, kv. 2, Karaganda; Kenes K. Bekishev, ulitsa Furmanova, 148, kv. 50, Alma-Ata; Orest G. Savchak, ulitsa Satpaeva, 58, kv. 1; Alexandr B. Klok, ulitsa Gogolya, 64, kv. 25, both of Karaganda; Tolgat M. Zhanabaev, ulitsa Vesnovskaya, 19, kv. 51, Alma-Ata; Mechislav-Valentinas K. Pakshtas, ulitsa Studencheskaya, 12, kv. 56, Mozyr; Boris N. Glotov, prospekt Lenina, 81, korpus 1, kv. 73, Karaganda; Garold K. Fink, ulitsa Shvernika, 1, kv. 11, Tselinograd; Alexei F. Timkin, Zeleny proezd, 45, korpus 6, kv. 16, Kalinin; Nikolai I. Zorin, Changarsky bulvar, 11, kv. 26, and Leonid M. Bobylev, ulitsa Petrozavodskaya, 15, korpus 2, kv. 22, both of Moscow, all of U.S.S.R.

Filed Jun. 3, 1982, Ser. No. 384,492

Int. Cl.[3] **B25D** *9/00*

U.S. Cl. 173—134 **3 Claims**



1. A hydropneumatic percussive tool, comprising:

(a) an elongated casing having a longitudinal axis;

(b) a hollow elongated generally cylindrical housing having radial passages therein, said housing being slidably mounted within said casing for reciprocation relative to said casing along said longitudinal axis;

(c) an implement having a working portion external to said casing, said implement having a shank aligned with said longitudinal axis and extending into an adjacent end of said housing through a hole in said casing,

said shank being slidably movable along said axis with respect to said casing and said housing, and having an impact-receiving end disposed within said housing,

said implement having a first collar surrounding and secured to said shank external to said casing, for restricting inward movement of said implement with respect to said casing,

said implement having a second collar surrounding and secured to said shank within said casing and external to said housing, for permitting said housing to drive said implement by engagement of said second collar by said adjacent end of said housing;

(d) a piston hammer of stepped configuration disposed within said housing and having an annular groove therein, said piston hammer having an impact-transmitting end disposed adjacent said impact-receiving end of said implement shaft, said piston hammer having portions of larger and smaller diameter separating the interior of said housing into first, second and third chambers.

said first chamber being in communication with a pressure passageway extending through one of said radial passages of said housing,

said second chamber being in communication with a discharge passageway extending through another one of said radial passages of said housing,

said third chamber being adapted to be filled with a compressed gas to serve as a pneumatic accumulator;

(e) the distance between said radial passages of said housing through which said pressure and discharge passageways extend, being greater than the maximum distance between said impact-transmitting end of said piston hammer and said impact-receiving end of said implement shaft;

(f) a tubular element disposed within said housing adjacent an end of said housing remote from said implement shank, said tubular element being separate from said piston ham-

mer and disposed coaxially with said shank of said implement,

one end of said tubular element extending into said third chamber,

the other end of said tubular element cooperating with said casing to transmit thereto a force from said pneumatic accumulator; and

(g) a hydraulic distributor having a cylindrical chamber, with a control valve slidably disposed within said cylindrical chamber and dividing said cylindrical chamber into two portions,

one of said cylindrical chamber portions being in continuous communication with said second chamber via the radial passage through which said discharge passageway extends,

the other of said cylindrical chamber portions communicating with said annular groove of said piston hammer via another of said radial passages in said housing,

a port extending through a wall of said hydraulic distributor adjacent said cylindrical chamber,

said port being in communication with said first chamber,

said port periodically communicating with said cylindrical chamber when said port is not blocked by said control valve,

said port being periodically blocked from communication with said cylindrical chamber by said control valve.

4,505,341

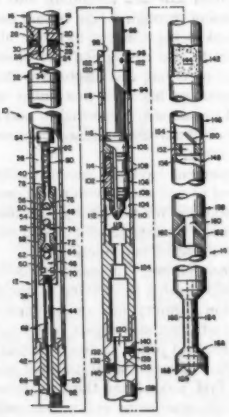
COMBINATION CLEAN-OUT AND DRILLING TOOL

Arlin R. Moody, Box 277, Loving, Tex. 76062, and Bobby J. Moody, Box 477, Highway 114 West, Levelland, Tex. 79336

Continuation-in-part of Ser. No. 358,652, Mar. 16, 1982, Pat. No. 4,421,182. This application Dec. 16, 1983, Ser. No. 562,723

Int. Cl.³ F21B *21/10*

U.S. Cl. 175—65 **55 Claims**



1. A tool for use in a bore hole for retrieving an object surrounded by debris, comprising:

a lower assembly having means for mounting a wash pipe at the lower end thereof, a debris chamber for holding debris, at least one trap valve in fluid communication with the bore hole and debris chamber for permitting fluid and debris to flow only from the bore hole, through the wash pipe and into the debris chamber, a barrel section having a smooth, cylindrical inner wall, a lower valve assembly in fluid communication with said barrel section and said debris chamber, said lower valve assembly being activatable between an open position permitting fluid flow between the barrel section and debris chamber and a closed position blocking flow therebetween, and said barrel section having a closure means for enclosing one end of the inner wall and having an aperture therethrough;

an upper assembly having a hollow kelly for sliding motion through the aperture in said closure means for joint rotation of said upper and lower assemblies, a piston assembly mounted on the kelly in sliding, sealed contact with the inner wall of the barrel section to define a first chamber within the barrel section, said piston assembly having at least one port for communication between the first chamber and hollow kelly, the closure means and piston assembly being engageable, a fluid container and at least one drain valve for fluid communication between the fluid container and the bore hole to relieve fluid pressure within the fluid container, and an upper valve assembly being positioned for fluid communication between the hollow kelly and fluid container permitting flow only from the hollow kelly to the fluid container; and

the tool being operable in a hydraulic mode by removing said lower valve assembly and said drain valves in the upper assembly with said upper valve assembly installed, reciprocating the upper assembly, the upward motion of said piston assembly driving fluid and debris from the bore hole, through the wash pipe and into the debris chamber through the trap valve, the trap valve closing and upper valve assembly opening on the downstroke to release the pressure in the debris chamber, and lowering the tool within the bore hole while reciprocating the upper assembly so that the object enters the wash pipe and can be removed from the bore hole with the tool and wash pipe, the tool being operable in a hydrostatic mode by removing said upper valve assembly with said lower valve assembly and drain valves installed, moving said upper assembly downward to activate said lower valve assembly to the open position through contact with said piston assembly, causing fluid and debris to be driven into the debris chamber, and lowering the tool within the bore hole so that the object enters the wash pipe and can be removed from the bore hole with the tool.

4,505,342

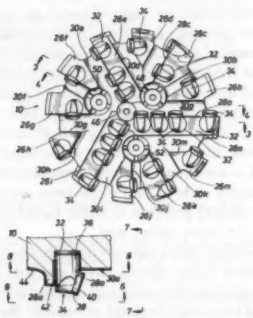
DRILL BIT

John D. Barr, Cheltenham, and John M. Fuller, Stroud, both of England, assignors to NL Industries, Inc., New York, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,657

Int. Cl.³ E21B *10/46*

U.S. Cl. 175—329 **29 Claims**



1. A full bore drag type well drilling bit adapted for rotation in a given direction comprising:

a bit body comprised of a generally non-frangible metallic material, said bit body having an operating end face the general configuration of which is defined by said metallic material to include a plurality of upsets each having a leading edge surface and at least one recess extending through each such leading edge surface into said metallic

material, said end face of said bit body further comprising a plurality of inset flow channels each having a pair of side walls disposed respectively on the leading and trailing sides thereof, each of said leading edge surfaces of said upsets having a respective one of said flow channels extending therealong, said leading edge surface and the trailing side wall of said respective flow channel forming a common surface facing generally into said direction of rotation and extending to te bottom of said channel;

and a plurality of cutting members carried by said bit body, each of said cutting members comprising an elongate mounting body and a cutting formation on the exterior of said mounting body adjacent one end thereof, at least a majority of said mounting bodies being mounted in respective ones of said recesses with their cutting formations facing outwardly from the respective leading edge surfaces generally toward the respective flow channels and generally fully exposed along said leading edge surfaces whereby said cutting formations are disposed at least partially in the respective flow channels;

each of said flow channels having a length extending generally parallel to said side walls and a width extending between said side walls, said width being generally uniform along a substantial portion of said length, and said generally uniform width further being generally on the order of magnitude of the dimensions of said cutting members measured in said direction of rotation.

4,505,343

PLURAL-PART EARTH BIT, AND AN IMPROVED BIT HEAD THEREFOR

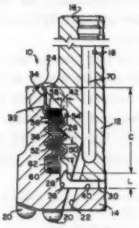
Robert W. Hughes, and James F. Cantrel, both of Easton, Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 383,976, Jun. 1, 1982, Pat. No. 4,413,689. This application Aug. 17, 1983, Ser. No. 523,965

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.³ E21B *10/00*

U.S. Cl. 175—409 **16 Claims**



1. An improved bit head, for a plural-part earth bit, said head having a central axis, and an axially-extended, circumferential wall, said wall having a thread of a given threaded depth, formed therein, and said wall circumscribing said axis, wherein the improvement comprises:

means lining and engaging said thread in said wall for engaging a bit shank and (a) for transferring torque from such a shank to said bit head, and (b) for limiting torque transferred from such a shank to said bit head; wherein said thread lining and engaging means comprises a lining having a radial thickness which is greater than said given thread depth.

4,505,344

MULTI-AXLE VEHICLE

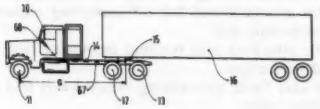
John Hobbs, Rockford, Ill., and Wolfgang Schrader, Beilstein, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,967

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1982, 3208315

Int. Cl.³ G01G *19/08, 3/14;* B62D *53/00*

U.S. Cl. 177—136 **13 Claims**



1. In a multi-axle load vehicle including a tractor having a driver's cabin, a sensor for sensing a load acting on the vehicle and producing an electrical signal corresponding to said load, and an indicator device positioned in said cabin of the vehicle and operative for receiving said signal and supplying a driver with the information about said load, the improvement comprising that

(a) said tractor includes a supporting plate and a holder axially displaceable on said tractor, said holder being attached in such a manner that a pin horizontally extends through holes in said holder and said supporting plate so that said pin holds said holder in overlapping relationship with said pin,

(b) said sensor is accommodated in said pin, said pin being formed of magnetic material; and

(c) said sensor is a magnetoelastic pickup.

4,505,345

FORCE MEASURING DEVICE

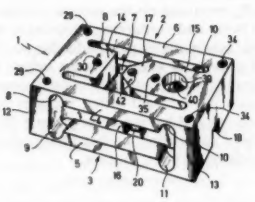
Hans Jetter, Balingen, Fed. Rep. of Germany, assignor to Bizerba-Werke Wilhelm Kraut GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 19, 1982, Ser. No. 442,914

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1981, 3147470

Int. Cl.³ G01G *3/14*

U.S. Cl. 177—211 **16 Claims**



1. A device for measuring force comprising:

first and second spaced parallelogram guides provided with a load supporting surface formed in a one-piece block;

an independent bending measuring body mounted on said block equidistant between said guides;

means for transmitting a force from a load bearing on said parallelogram guides to said bending measuring body;

a pair of crosspieces which connect opposite ends of said first parallelogram guide to corresponding opposite ends of said second parallelogram guide;

a first cantilevered projection protruding from one of said crosspieces equidistant from said parallelogram guides;

a second cantilevered projection protruding from the other crosspiece equidistant from said parallelogram guides, the

free ends of said first and second cantilevered projections overlapping each other;

overload safety means between said overlapping ends for limiting the deflection of said first projection toward said second projection, said overload safety means comprising a screw inserted into the free end of said first projection to strike against the free end of the second projection when an overload occurs;

a plug-like extension of smaller diameter than the body of said screw, extending from said screw;

a corresponding recess in the free end of said second projection for accomodating said plug-like extension;

means for attaching said force transmitting means to said first projection; and

means for attaching said bending measuring body to said second projection;

whereby said force transmitting means loads said bending measuring body.

4,505,346

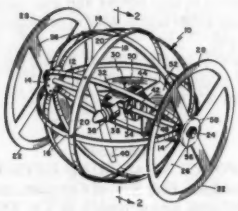
ROLLING VEHICLE

Leonard E. Mueller, 4557 Mt. Hubbard Ave., San Diego, Calif. 92117, assignor to Leonard E. Mueller and Carl R. Brown, both of San Diego, Calif.

Filed Mar. 29, 1982, Ser. No. 362,877

Int. Cl.³ B62D *57/04*

U.S. Cl. 180—7.4 **12 Claims**



1. A rolling vehicle, comprising:

a generally spherical body of open framework construction having an axle at the axis of rotation, a plurality of substantially semi-circular ribs secured between opposite ends of the axle and extending radially therefrom at angularly spaced positions;

a pod pivotally mounted on the central portion of said axle within the body and containing propulsion means having a thrust axis substantially perpendicular to the axle;

the center of gravity of said pod being below the axle;

and aerodynamic lifting and directional control surfaces mounted on said pod, said lifting surfaces being substantially horizontal and having aerodynamic lift characteristics capable of supporting a substantial part of the weight of the vehicle in forward motion.

4,505,347

HEAVY-DUTY VEHICLE SYSTEM

Georg Prechtel, Pfedelbach, Fed. Rep. of Germany, assignor to Willy Scheuerle Fahrzeugfabrik GmbH & Co., Pfedelbach, Fed. Rep. of Germany

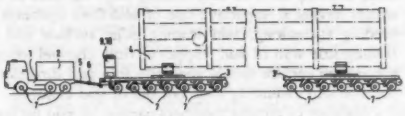
Filed Sep. 29, 1982, Ser. No. 427,273

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143723

Int. Cl.³ B62D *53/00, 59/04;* B60K *41/00*

U.S. Cl. 180—14.2 **31 Claims**

1. A heavy-duty vehicle system, comprising a driving vehicle having a main drive; a plurality of driven multi-axle vehicles connected with one another and arranged so that at least some of them have an additional drive, said vehicles being releasably connected with one another via load-supporting elements and/or supported loads; sensing means arranged to sense travel conditions; and self-acting automatic computer control means connected with said sensing means and arranged



to control said additional drives of said driven vehicles in correspondence with said driving vehicle and in dependence upon the travel conditions sensed by said sensing means.

4,505,348

ARRANGEMENT IN A HEAVY MOTOR VEHICLE TO ACHIEVE RELATIVE ROTATION IN A CONDUIT CONNECTION

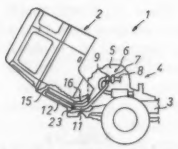
Bengt G. Gadefelt, and Birger S. I. Enlund, both of Södertälje, Sweden, assignors to Saab-Scania Aktiebolag, Sweden

Filed Dec. 14, 1982, Ser. No. 449,778

Claims priority, application Sweden, Dec. 22, 1981, 8107692

Int. Cl.³ B62D *33/06*

U.S. Cl. 180—89.14 **8 Claims**



1. An arrangement for supplying air to a motor vehicle combustion engine, comprising:

a charge air cooler mounted in a fixed position relative to a tiltable body unit of a motor vehicle, the body unit being tiltably mounted relative to a frame of the motor vehicle;

a first conduit for connecting a supercharger on the frame to the charge air cooler for supplying air to the charge air cooler; and

a second conduit for connecting the charge air cooler to an engine on the frame for supplying air from the charge air cooler to the engine;

a pipe end mounted to the charge air cooler and extending from the charge air cooler about a respective center line;

one of the first and second conduits comprising a flexible hose having a hose end connected to the pipe end and rotatable relative to the pipe end about the respective center line for forming a swivel joint together with the pipe end.

4,505,349

STEERING MEANS FOR, AND IN COMBINATION WITH, AN ARTICULATED VEHICLE

Bernard J. Murphy, Mountain Lakes, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jun. 2, 1983, Ser. No. 500,575

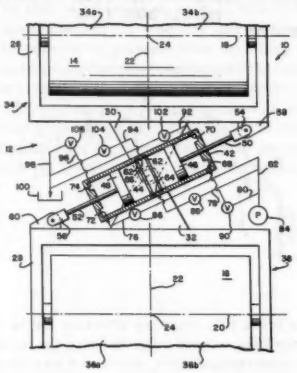
Int. Cl.³ B62D *5/10;* E01C *19/26*

U.S. Cl. 180—136 **11 Claims**

1. Steering means for an articulated vehicle, in which such vehicle has first and second, spaced-apart, vehicular units coupled together, by a pivotable coupling means, on a pivot axis, comprising:

a single, dual-ended, linear motor means, fluid-operable for effecting steering displacement of such aforesaid vehicular units relative to each other;

means for admitting pressured fluid into said single motor means;
means for discharging fluid from said single motor means;
means joined to said single motor means for mounting said single motor means, intermediate the ends of the latter, to such aforesaid pivotable coupling means;
first means for coupling one of said ends to one of such aforesaid, coupled, vehicular units; and
second means for coupling the other of said ends to the other of such aforesaid, coupled, vehicular units; wherein



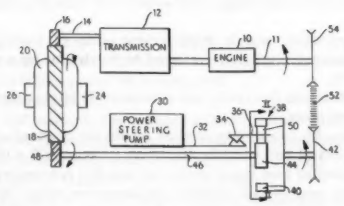
said single motor means includes piston means, responsive to pressured fluid admitted thereinto and discharged therefrom, for translating said ends, relative to said mounting means, for effecting steering of such an aforesaid vehicle in a left-hand direction, for effecting steering of such vehicle in a right-hand direction, for effecting steering of such vehicle in a left crab attitude, and for effecting steering of such vehicle in a right crab attitude, selectively.

4,505,350

DRIVE SYSTEM FOR AUTOMOTIVE POWER STEERING PUMP

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1982, Ser. No. 451,694
Int. Cl.³ B62D *5/02*
U.S. Cl. 180—143 **8 Claims**



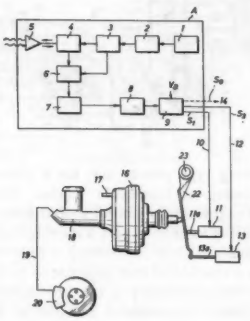
1. A system for driving an automotive power steering pump from an engine comprising:
a hydraulic pump;
gearing means having first and second input elements driveably connected to an output element which is connected to the pump;
means for driveably connecting the engine shaft to the first input element; and
means for driving the second input element at a speed that varies with the speed of the vehicle wheels such that the speed of the output element and of the pump decreases as vehicle speed increases.

4,505,351

AUTOMATIC BRAKING SYSTEM FOR VEHICLES

Masao Nishikawa, Tokyo, and Takashi Aoki, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1981, Ser. No. .7,112
Claims priority, application Japan, Nov. 4, 1980, 55-155028; Dec. 26, 1980, 55-186279
Int. Cl.³ B60T *8/04*
U.S. Cl. 180—169 **7 Claims**



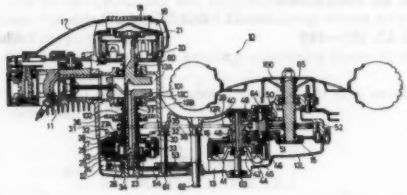
1. An automatic braking system for a vehicle, comprising:
automatic command system means for giving a command including at least one braking signal of a level in response to the need for braking;
a fluid pressure source;
a braking device having an input member which is manually actuatable;
control means for actuating said input member by applying thereto a fluid pressure from said pressure source in response to said level of said braking signal;
said fluid pressure comprising a pneumatic pressure supplied to said control means;
said input member comprising a brake pedal and a master cylinder;
said control means comprising a multiplying device operatively connected with said brake pedal and said master cylinder;
said multiplying device including a piston operable with a pressure difference thereacross and a feedback route partially feeding back a reaction from said master cylinder to said brake pedal;
said pressure difference being applicable to said piston in response to said braking signal by way of a first operation route operatively independent of a second operation route for applying said pressure difference to said piston in response to a pedal force from said brake pedal;
said pressure difference being controlled by a control valve operable with either of said first and second operation routes;
said brake pedal comprising a manual lever member operatively connected to said second operation route and adapted to be manually rotatable, an automatic lever member operatively connected to said first operation route and rotated according to said braking signal, and a control lever member controlling movement of said automatic lever member according to the strength of said braking signal; and
a spring means connecting said manual lever member with said control lever member such that said control lever member remains relatively stationary over a portion of the path of movement of said manual lever member.

4,505,352

SWING TYPE POWER UNIT FOR A TWO-WHEELED MOTOR VEHICLE

Takanori Onda, Saitama, and Takeo Saito, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1983, Ser. No. 455,717
Claims priority, application Japan, Jan. 9, 1982, 57-1348
Int. Cl.[3] B62K *25/06*
U.S. Cl. 180—219 9 Claims



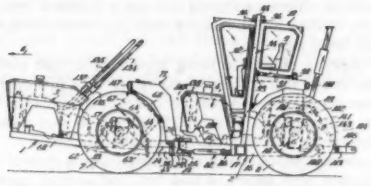
1. In a swing type power unit for a two-wheeled motor vehicle including a four-cycle engine, the improvement wherein said engine has an output shaft disposed in a transmission case adjacent to its front end, a starting clutch provided on said output shaft, a shaft for driving a rear wheel being disposed in said transmission case adjacent to its rear end, a high-speed clutch being provided on said driving shaft, a wet type multi-stage power transmission mechanism being provided between said output shaft and said driving shaft, said case being rotatably connected at its front end to a vehicle body frame, said case being connected adjacent to its rear end to said frame by a shock absorber, the same oil being used in common for lubricating said engine and said transmission, said oil being stored in an oil pan defined by a bottom wall of said case and extending substantially longitudinally of the entire power unit.

4,505,353

ARTICULATED TRACTOR WITH TWO ENGINES IN TANDEM

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Division of Ser. No. 733,373, Oct. 18, 1976, Pat. No. 4,173,352.
This application Jan. 18, 1979, Ser. No. 4,565
Claims priority, application Netherlands, Oct. 16, 1975, 7512128
Int. Cl.[3] B60K *5/08;* B62D *53/02*
U.S. Cl. 180—235 7 Claims



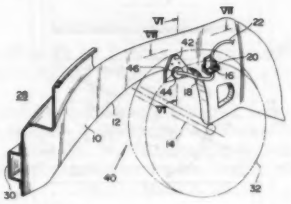
1. A tractor which comprises: a front portion and a rear portion; pivot means having a substantially vertical pivot axis connecting said portions in tandem whereby they are turnable about said pivot means within limits; and front portion including a front engine and a front axle with a plurality of front ground engaging wheels mounted on each side thereof; said rear portion including a rear engine, a rear axle with a plurality of rear ground engaging wheels mounted on each side thereof and coupling means for receiving agricultural implements; the length of said first portion from its front end to said axis, the length of said second portion from said axis to the rear end of said coupling means, and the distance between said axles all being substantially equal.

4,505,354

FRONT BRAKE TUBE RETAINING STRUCTURE FOR AUTOMOTIVE VEHICLE

Takashi Suzuki, Zama; Syuzi Yamagata, Yokohama, and Jyunji Osako, Zama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 14, 1982, Ser. No. 387,815
Claims priority, application Japan, Jun. 18, 1981, 56-94329
Int. Cl.[3] B60T *17/04*
U.S. Cl. 180—297 8 Claims



1. A front brake tube retaining structure for an automotive vehicle, comprising a hood ledge defining the inside and outside of an engine compartment and having an arch portion for installation of a drive shaft extending across the hood ledge, a support having an upper end attached to said hood ledge at a location adjacent the arch portion and a lower end projecting downwardly from the arch portion, and a brake tube arranged to pass under the arch portion of the hood ledge for thereby extending between the inside and outside of the engine compartment and retained by said support at the lower end thereof.

4,505,355

HYDROSTATIC TRAVELLING DRIVE SYSTEM WITH TOWING CIRCUIT

Helmut Scheurenberg, and Manfred Funke, both of Ratingen, Fed. Rep. of Germany, assignors to Losenhausen Maschinenbau AG, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 24, 1983, Ser. No. 460,225
Claims priority, application European Pat. Off., Jan. 30, 1982, 82710003.3
Int. Cl.[3] B60K *17/10*
U.S. Cl. 180—308 8 Claims

1. Hydrostatic travelling drive system for vehicles, comprising

(a) a hydraulic variable displacement pump (3) having first and second ports and arranged to be driven by a prime mover,

(b) at least one hydraulic travel motor (2) having first and second ports,

(c) hydraulic connecting conduit means for connecting said first port of said variable displacement pump (3) with said first port of said travel motor (2) and for connecting said second port of said variable displacement pump (3) with said second port of said travel motor (2), whereby a hydraulic circuit is formed by said variable displacement pump (3), said travel motor (2) and said connecting conduit means, and whereby said variable displacement pump (3) and said travel motor (2) form a variable hydraulic transmission for transmitting the driving power from the prime mover to drive members (1) of the vehicle,

(d) a fluid reservoir (5)

(e) a filling pump (4) arranged to be driven together with the variable displacement pump (3) and having an inlet port, which communicates with said fluid reservoir (5), and an outlet port,

(f) means for communicating said outlet port of said filling pump (4) with said hydraulic circuit,

(g) a parking brake (6) acting on said drive members (1) and arranged to be released by fluid pressure and to be applied, when this fluid pressure is removed,

(h) a brake conduit (7) between said outlet port of said filling pump (4) and said parking brake (6)

(i) brake valve means (9) arranged in said brake conduit (7) and having first and second valve positions, which brake valve means,

(i_1) in its first valve position, permits fluid flow through said brake conduit (7), whereby said parking brake (6) can be released by pressure from the filling pump, and

(i_2) in its second valve position shuts-off the brake conduit (7) and connects the parking brake (6) to the fluid reservoir (5), whereby said parking brake (6) is applied, and

(j) means for generating a fluid pressure in the parking brake (6) independent of the filling pump (4) to permit the parking brake (6) to be released while the vehicle is being towed, when the prime mover fails and the pressure from the filling pump (4) is removed,

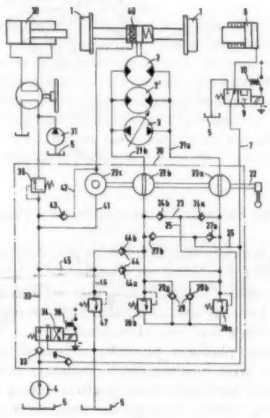
characterized in that

(k) said means for generating a fluid pressure in said parking brake (6) include a towing circuit (20) connected in parallel to said hydraulic travel motor (2) through connecting conduits (21*a*, 21*b*), and comprising

(k_1) shut-off valve means (22) for separating said towing circuit (20) from said ports of said travel motor (2),

(k_2) a hydraulic circuit, which extends between said ports of said travel motor (2) and includes pressure limiting means (28*a* and 28*b*, respectively), which have inlet and outlet ports, and

(k_3) communication means (26,27*a* and 27*b*, respectively) between one port of said travel motor (2) and said parking brake (6) such that the fluid pressure, which is generated by the travel motor (2) then acting as pump upstream of said pressure limiting means (28*a* and 28*b*, respectively), causes the parking brake (6) to be released, when the vehicle is being towed.



4,505,356

OPERATOR'S SEAT AND CONTROLS ARRANGEMENT FOR A TANDEM ROAD ROLLER

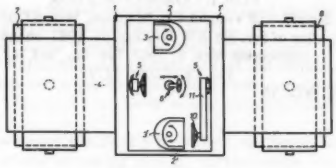
Heinrich Baier, Willich; Hans-Georg Waschulewski, Mettmann, and Hans-Werner Kürten, Ratingen, all of Fed. Rep. of Germany, assignors to Losenhausen Maschinenbau AG., Dusseldorf, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 470,939

Claims priority, application European Pat. Off., Mar. 19, 1982, 82102247.2

Int. Cl.³ B60K *26/00*

U.S. Cl. 180—322 **14 Claims**



1. Operator's seat and controls arrangement for a tandem road roller with roller barrels comprising an operator's platform with two operator's seat (3,3'), two steering device (5) and a control stick (6), characterized in that

(a) the operator's seats (3,3') are mounted side by side for rotation substantially on the transverse center line of the operator's platform and in the plane of the respective barrel edges,

(b) the steering devices (5) are mounted on opposite transverse sides of the driver's platform substantially on the longitudinal center plane of the operator's platform and pivotable about an axis extending in said center plane such that each said steering device may be pivoted through said center plane to be accessible from either of said operator's seats, and

(c) said control stick (6) is arranged in the middle between the operator's seats (3,3').

4,505,357

DEVICE FOR ELECTRICALLY CONTROLLING THE SPEED OF TRAVEL

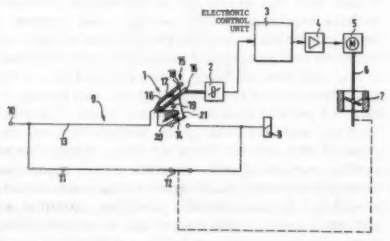
Manfred Pfalzgraf, Frankfurt am Main, and Kunibert Graf, Kelkheim, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 4, 1983, Ser. No. 520,045

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1982, 3238218

Int. Cl.³ F02D *33/00*

U.S. Cl. 180—335 **8 Claims**



1. In a device for electrically controlling the speed of travel of an automotive vehicle, having a desired-value transmitter, which can be displaced by a gas pedal and whose output signal

can act on a setting member of an element which controls the fuel-air mixture of an internal combustion engine and having a pedal contact which can be acted on by the gas pedal in such a manner that when the gas pedal is moved out of the idling position, energy can be supplied to a unit which controls the speed of rotation of the motor, the improvement comprising

means for sensing an application of an outside force against said gas pedal including, a safety contact closable only by mechanical actuation of the gas pedal out of its idle position by said force, said safety contact being arranged in series with the pedal contact.

4,505,358

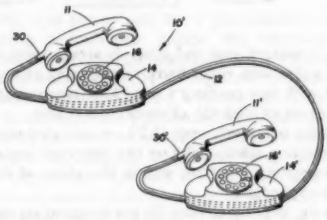
VOICE COMMUNICATOR

Ulrich Sielaff, 118 Vaughn Ct., Madison, Wis. 53705

Continuation of Ser. No. 338,516, Jan. 11, 1982, abandoned. This application Nov. 8, 1983, Ser. No. 549,743

Int. Cl.³ G10K *11/12*

U.S. Cl. 181—18 **5 Claims**



1. Acoustic transmission apparatus for simultaneous two way voice communication comprising

enlogated connector means configured to provide at least two continuous passages linearly extending therethrough wherein said connector means is substantially more than eight feet in length, unitary, without cross connection,

at least two hand sets each having a mouthpiece portion and an earpiece portion wherein said mouthpiece portion and said earpiece portion each is configured with an opening disposed in the face thereof of a diameter constituting a minor fraction of said face diameter, said hand sets being unitarily hollow,

a plurality of terminal pieces disposed one each in said mouthpiece portion opening and said earpiece portion opening of each said hand set wherein each said terminal piece is configured with a substantially tubular bore therethrough without bell shape and of a size which restricts possible invasion thereof by a user such as a child inserting a digital extremity and wherein each said terminal piece is configured with one end extremity insertable into an end portion of one of said passages in said connector means for communicating such passages through said face openings of said hand sets to ambient unconfined environment and without extension of said passages, said terminal pieces being connected to opposite end portions of said conector means by said mouthpiece portion disposed terminal piece of one said hand set being interconnected by a portion of said connector means comprising one said passage to said earpiece portion disposed terminal piece of another said hand set, and said mouthpiece portion disposed terminal piece of said another hand set being interconnected by another portion of said connector means comprising another said passage to said earpiece disposed terminal piece of said one handset, thereby providing sustantial isolated acoustical cross connection of the mouthpiece disposed terminal piece of said one handset with the earpiece portion disposed terminal piece of another said hand set,

at least two base sets on which said hand sets can be cradled, each said base set comprising a sounding means which can be actuated to transmit such sound through said connector means to one said hand set when another said hand set sounding means is actuated, each said base set comprising a closed cavity through which said connector means passes and makes contact, said sounding means comprising a resonator which is caused to make repeated intermittent contact with clapper means when operably actuated thereby causing vibrations to be imparted to said connector means through the walls and through the confines of said cavity.

4,505,359

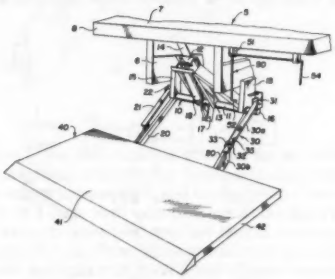
VEHICLE CARGO ELEVATOR WITH UPRIGHT STORAGE

Quentin D. Corley, Jr., 326 S. Rock Island, Dallas, Tex. 75207

Filed Dec. 7, 1982, Ser. No. 447,488

Int. Cl.³ B66B *9/20*

U.S. Cl. 187—9 R **8 Claims**



1. A cargo elevator for attachment to a cargo vehicle comprising

a pair of laterally spaced lift arms pivotally mounted on said vehicle for vertical oscillation as a unitary assembly; power means for oscillating said lift arm assembly;

a pair of laterally spaced parallel arms pivotally mounted on said vehicle for vertical oscillation;

an elevator platform pivotally mounted on said lift and parallel arms in a manner to maintain said platform in a generally horizontal load position during the raising and lowering thereof through the oscillation of said arm one each of said life and parallel arms being attached to said platform adjacent to each side thereof;

one of said parallel arms at one side of said platform being an articulated arm having a pivot elbow intermediate its ends;

a control strut mounted on said vehicle to be moved selectively into engagement with said articulated arm;

said control strut being engageable with said articulated arm, during upward movement thereof, to effect articulation thereof and consequent rotation of said platform to a vertical storage position relative to said vehicle;

the other of said parallel arms at the other side of said platform being mounted on said vehicle by means of a movable pivot, to allow said rotation of said platform.

4,505,360

ELEVATOR OPERATING SYSTEM

Shintaro Tsuji, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,472

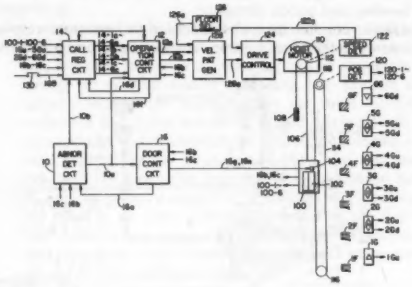
Claims priority, application Japan, Mar. 16, 1982, 57-41086

Int. Cl.³ B66B *5/02, 13/22*

U.S. Cl. 187—29 R **19 Claims**

1. An elevator operating system responsive to the detection of an abnormality of the operation of an elevator car to take an emergency measure which system comprises an elevator car,

abnormality detector means for detecting an abnormality of said operation of said elevator car and generating a signal indicating the detected abnormality; and call register means for registering car calls due to destination pushbuttons disposed on said elevator car and floor calls due to floor pushbuttons and releasing the registration of said car and floor calls, said call register means including response limiting means responsive to said abnormality indicating signal from said abnormality detector means to limit the response to at least one of said car calls and said floor calls, re-execution means responsive to said elevator car put in a predetermined state to generate a command re-execution signal for re-executing the operation identical to that detected as including said abnormality, and releasing means for releasing the limitation of the response when said abnormality detector means does not detect the abnormality included in the operation performed with the command re-execution signal.



4,505,361

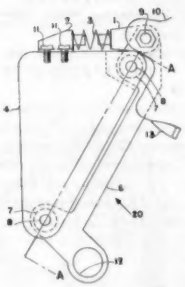
ANTI-CHATTER ASSEMBLY

Earl M. Thomas, 10344 118th St. N., Largo, Fla. 33544

Filed Dec. 27, 1982, Ser. No. 453,525

Int. Cl.³ F16D *55/22*

U.S. Cl. 188—26 **1 Claim**



1. A disc brake anti-rattle assembly, comprising,

a bias means,

a first retainer means disposed in supporting relation to a first end of said bias means,

said first retainer means fixedly secured to a fork portion of a two-wheel vehicle, exteriorly thereof,

a second retainer means disposed in compression-inducing relation to a second end of said bias means,

a caliper means,

said second retainer means fixedly secured to said caliper means, exteriorly thereof,

a mounting bracket to which said caliper means is mounted,

said caliper means and said mounting bracket provided with an upper and lower pair of first and second axially aligned bore means,

a first mounting pin that extends through both of said upper axially aligned bore means to unite the upper portion of said caliper and the upper portion of said mounting bracket,

said upper portion of said bracket mounted to the fork portion of the two-wheel vehicle,

a second mounting pin that extends through both of said lower axially aligned bore means to unite the lower portion of said caliper and the lower portion of said mounting bracket,

said lower portion of said bracket mounted to an axle or lower fork portion of said two-wheel vehicle,

a rotatable disc that forms a part of the disc brake assembly,

said first and second mounting pins disposed parallel to the axis of rotation of said rotatable disc,

said bias means disposed perpendicular to said first and second mounting pins so that said first and second mounting pins are urged to bear against their respective bores even when said bores have become enlarged as a result of wear,

said bias means specifically positioned relative to said first and second mounting pins to act thereupon through a lever arm in a pivotal direction,

said bias means urging said caliper means and hence said first and second mounting pins in the direction of forward travel of said vehicle so that activation of said disc brake assembly complements the activation of said bias means,

said external mounting of said bias means and said first and second retainer means permitting said anti-rattle assembly to be retrofit onto conventional disc brake assemblies,

and the amount of rattle-causing wear induced by frictional engagement between said first and second mounting pins and their respective bore means limited only by the functional length of said bias means.

4,505,362

DEVICE FOR AVOIDING MULTIPLE BOUNCES AGAINST A TARGET OF A MASS FALLING THEREON ALONG A RECTILINEAR TRAJECTORY

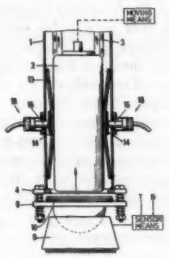
Pierre-Claude Layotte, les Mathes; Jean-Claude Dubois, and André James, both of Royan, all of France, assignors to Institut Francais du Petrole, Rueill-Malmaison, France

Filed Jul. 2, 1982, Ser. No. 394,981

Claims priority, application France, Jul. 3, 1981, 81 13298

Int. Cl.³ B65H *59/10;* **B60T** *11/10;* **G01N** *3/30*

U.S. Cl. 188—67 **15 Claims**



1. In a device for generating seismic waves in the earth by striking a mass having a lateral wall against a target member, the device comprising an elongated guide member having first and second ends, and inside which the mass is guided along inner walls thereof, the target member secured to the first end of said guide member, moving means for moving the mass to the second end of said guide member, retaining means for intermittently retaining said mass in the vicinity of said second end and positioning means for placing the guide member in a

position wherein said target member is coupled to the earth and said mass is positioned for dropping towards the target member, the improvement comprising a system for avoiding multiple shocks against said target member produced by resultant bounces of the mass occurring after a first impact on said target member, said system comprising a deformable element secured to the inner walls of the guide member, jack means secured to the guide member for radially forcing the deformable element in the direction of and against a lateral wall of the mass, when said mass is in a position adjacent said deformable element whereby said jack means can be actuated for holding said mass above the target member after the first bounce thereof, sensor means for generating a signal in response to a first impact of the mass against the target member, and control means associated with said sensor means and said jack means for actuating said jack means in response to said signal.

4,505,363

TWIN-DISC BRAKE HAVING AXIALLY SLIDING CALIPERS

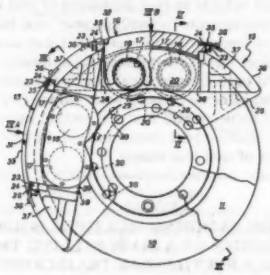
Jean Herbulot, Franconville, and Bernard Jumel, Pierrefitte, both of France, assignors to VALEO, Paris, France

Filed Oct. 26, 1982, Ser. No. 436,818

Claims priority, application France, Nov. 4, 1981, 81 20658

Int. Cl.³ F16D *55/224, 55/40, 65/20*

U.S. Cl. 188—72.5 **19 Claims**



1. A twin-disc brake comprising two axially adjacent rotatable brake discs, two calipers angularly fixed relative to each other and associated with the respective discs, each of said calipers having hydraulic cylinder means receiving piston means for directly applying pad means axially against one side of the associated disc, a fixed support common to both of said calipers and extending over an angular sector of about 180°, each of said calipers comprising a C-shaped member straddling the associated disc, guide means defined on said common fixed support for guiding each of said calipers for axial sliding movement thereon, said calipers being disposed circumferentially adjacent each other on said common fixed support, the hydraulic cylinder means of each of said calipers being arranged on only said one side of the associated disc, each of said calipers having a reaction face cooperable with other pad means for applying said other pad means against the other side of its associated disc.

4,505,364

PUSH-BUTTON CLUTCH CONTROL SYSTEM

Ralph F. Goucher, and Kathleen S. Goucher, both of 104 Diamond Dr., Livermore, Calif. 94550

Continuation of Ser. No. 76,558, Sep. 18, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,565

Int. Cl.³ B60K *41/02*

U.S. Cl. 192—0.02 R **10 Claims**

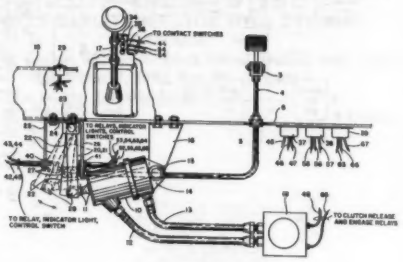
1. A mechanism for controlling a clutch in the power transmission system of a motor vehicle having a manually operated lever for shifting gears in the system, said clutch being operable by depressing and releasing a foot pedal, said motor vehicle further having an electrical power source, comprising:

a reversible hydraulic pump connected to and driven by said electrical power source;

primary electrical switching means governing the amount of electrical power delivered to said pump from said electrical power source and controlling the direction and flow rate of fluid driven by said pump;

a pressure responsive cylinder having relatively movable housing and piston elements;

hydraulic conduit means connecting said pressure responsive cylinder to said pump, enabling said pump to drive



said piston element in either the extended or retracted direction relative to said housing element;

mechanical linkage means connecting said pressure responsive cylinder to said clutch foot pedal, such that said pedal is driven by the relative motion of said piston and housing elements; and

secondary electrical switching means connected to said pump, actuated by said mechanical linkage means, such that the electrical power supplied to said pump by said primary switching means is turned off by said secondary switching means when said clutch attains either its fully engaged or fully disengaged positions.

4,505,365

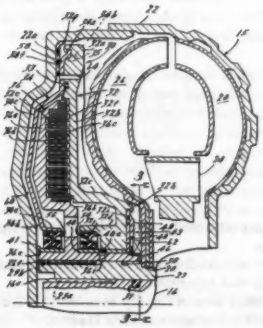
VISCOUS BYPASS COUPLING FOR TORQUE CONVERTER

Warren G. Bopp, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 31, 1983, Ser. No. 499,616

Int. Cl.³ F16D *47/06*

U.S. Cl. 192—3.29 **10 Claims**



1. In a viscous coupling of the type including an annular housing assembly adapted to be positioned within the housing of a fluid coupling and defining an annular chamber containing a viscous fluid, the fluid coupling housing having an annular friction surface adapted for clutching coaction with the annu-

lar housing; an annular clutch assembly disposed in the chamber including an axially extending hub portion adapted for rotational driving and sliding connection to a shaft in the fluid coupling housing and an annular radially extending clutch portion having working means for viscous clutching coaction with a corresponding working means on a confronting portion of the annular housing; seal means cooperating between the annular housing and the clutch hub portion; the improvement comprising:

first and second radially extending annular side wall members forming said annular housing and defining said chamber, said first side wall member formed of aluminum and having an annular axially extending hub portion at its radially inner edge journaled on the outer peripheral surface of the clutch hub portion, said side wall hub portion and said clutch assembly providing the sole radial and axial support for the housing assembly, and said second side wall member being formed of a ferrous metal having an annular radially extending portion at its outer periphery fixed to an outer peripheral portion of the first side wall member and defining an annular clutching surface for said clutching coaction with said annular friction surface of said fluid coupling housing.

4,505,366

SEWING MACHINE MOTOR UNIT

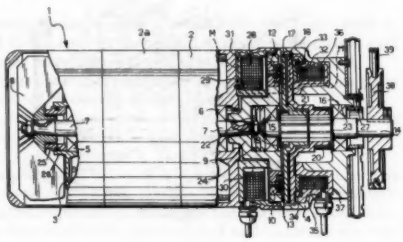
Mario Sangiorgi, Vigevano, Italy, assignor to Mazzini Motori S.r.l., Vigevano, Italy

Filed Sep. 20, 1982, Ser. No. 420,231

Claims priority, application Italy, Nov. 20, 1981, 53826/81[U]

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—18 B **5 Claims**



1. A motor unit for sewing machines, comprising:

a fixed structure of non-ferromagnetic material;

a motor mounted within said fixed structure;

a stop ring of non-ferromagnetic material;

a drive shaft driven by the motor;

a flywheel of ferromagnetic material connected to the drive shaft, said stop ring being of non-ferromagnetic material and being fixed to said flywheel;

an output shaft, and

an electromagnetically operated brake-clutch unit for controlling a connection between the drive shaft and the output shaft, said brake-clutch unit including:

a clutch disc and a brake disc both of ferromagnetic material, said clutch disc and said brake disc being slidable axially on the output shaft and connected for rotation therewith, the clutch disc and the brake disc facing said flywheel and said fixed stop ring, respectively, a clutch winding and a brake winding carried by the fixed structure, the flywheel being interposed between the clutch winding and the clutch disc, and the fixed stop ring being interposed between the brake winding and the brake disc, ferromagnetic inserts mounted on said fixed structure, said ferromagnetic inserts defining annular cavities, the clutch winding and the brake winding being mounted in said annular cavities respectively on said ferromagnetic inserts carried by the fixed structure, and two annular friction linings for a frictional connection of the clutch disc and the brake disc with the flywheel and the fixed stop ring.

4,505,367

FLUID FRICTION CLUTCH

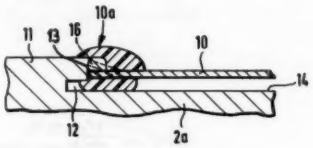
Hans Martin, Stuttgart, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Fed. Rep. of Germany

Filed Dec. 3, 1982, Ser. No. 446,683

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149104

Int. Cl.³ F16D *33/12, 43/25, 35/00*

U.S. Cl. 192—58 B **6 Claims**



1. A fluid friction clutch comprising:

housing means defining a working space and a reservoir space,

primary and secondary parts mounted for relative rotation with respect to each other and exhibiting working surfaces disposed in said working space,

valve means interposed between the working space and the reservoir space for controlling a supply of clutch fluid to the working space to thus control the fluid drive connection between the working surfaces of the primary and secondary parts,

and temperature responsive valve control means for controlling an opening of said valve means as a function of temperature, said valve control means including a bimetallic strip means mounted at a cover means of the housing means, and a mechanical valve actuation drive arrangement extending from the bimetallic strip, through the cover means, and to the valve means to selectively move the same,

wherein said bimetallic strip is held in position at said cover by pretensioned tongue means at the ends of said strip at finger means formed on said cover,

and wherein said bimetallic strip is further fixedly secured at said cover by elastic securing plug means in the regions of the interengaging tongue and finger means to continuously resiliently support the bimetallic strip against the finger means.

4,505,368

OPERATOR-CONTROLLED AUTOMOTIVE GEAR OR TRANSMISSION CHANGE SYSTEM

Fritz Ackermann, Stuttgart, and Eberhard Schnaibel, Hemmingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,359

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137217

Int. Cl.³ B60K *41/28*

U.S. Cl. 192—0.092 **10 Claims**

1. In a vehicle, an operator-controlled automotive gear or transmission change system, said vehicle having an automotive-type engine (E), a transmission (T), and a clutch (14) interposed between the engine and the transmission,

comprising

an operator-controlled selector (20) providing gear selector output signals representative of a selected transmission gear and controlling the transmission (T);

a fuel metering means (12) controlling speed and power of engine operation;

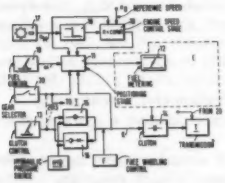
an operator-controlled fuel supply control means (10);

an operator-controlled clutch control means (13);

a clutch disconnect control means (15) connected between the clutch control means and the clutch (14) for controlling clutch disconnect operation as a consequence of operation of the clutch control means (13);

a clutch connect control means (16) connected between the clutch control means (13) and the clutch (14) for controlling clutch connection or engagement operation after a disconnect operation, with time delay;

a fuel metering positioning stage (11) receiving the gear selector output signals, connected to and controlling the



fuel metering means (12) to cause the engine (E) to operate at a controlled speed corresponding to a selected transmission gear;

and an engine speed reference signal generating means (19) for generating a signal representative of a predetermined engine speed in the low speed operating range thereof, said reference signal generating means being coupled to said positioning stage (11), said positioning stage in turn controlling the fuel metering means (12) and hence the engine (E) upon change of transmission gearing from a neutral position to a first or starting gear to provide for an initial engine speed control at said predetermined speed upon engagement of the clutch and upon starting of the vehicle in which the engine is installed.

4,505,369

CLUTCH THRUST BEARING

Leo Müller, Easleben; Walter Köder, Schweinfurt; Manfred Brandenstein, Eussenheim; Lothar Walter, Schweinfurt; Ludwig Edelmann, Premich; Roland Bonengel, Geldersheim, and Roland Haas, Lendershausen, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

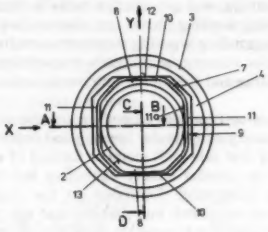
Filed Apr. 23, 1982, Ser. No. 371,495

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116177

Int. Cl.³ F16D *23/14*

U.S. Cl. 192—98 **13 Claims**

1. A clutch throwout, including a self-centering clutch bearing, a sliding sleeve means, said bearing including a stationary bearing ring connected with said sliding sleeve means via an intermediate element, said intermediate element having guides for allowing said cluth bearing to slide radially in two mutually crossing radially in two mutually crossing radial directions relative to said sliding sleeve means, said intermediate element being radially interlocked with prestress with said stationary



bearing ring and said sliding sleeve means in two mutually crossing directions.

4,505,370

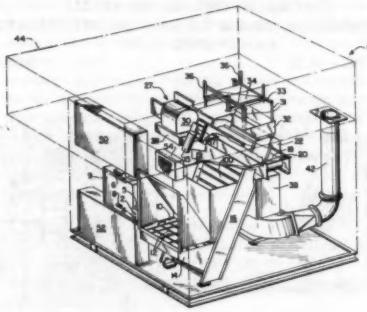
METHOD FOR RECYCLING CANS

George F. Swenck, Henrico County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jan. 21, 1983, Ser. No. 459,826

Int. Cl.³ G07C *1/06*

U.S. Cl. 194—4 C **9 Claims**



1. In a method for recovering conductive material from a material input supplied by a customer comprising separating magnetic material from said material input, separating said conductive material from the remainder of said material input, identifying the amount of conductive material supplied in said material input and storing said conductive material the improvement comprising recombining said magnetic material and said conductive material after said identifying of the amount of conductive material supplied and storing said magnetic material-conductive material combination.

4,505,371

FAN-SHAPED LOADER FOR MAKING A LOOSELY FELTED MAT OF ALIGNED WOOD FLAKES

Gordon P. Krueger, Hancock; Anders E. Lund, and Roy D. Adams, both of Houghton, all of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Apr. 5, 1982, Ser. No. 365,601

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—382 **4 Claims**

1. Apparatus for forming an elongated loosely felted mat of thin elongated wood flakes with said flakes being aligned in mutually parallel relation and being aligned with the longitudinal direction of the elongated mat, said apparatus comprising:

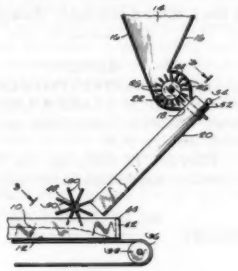
means defining a mat supporting surface,

means for depositing wood flakes on said supporting surface, said means for depositing including

means for holding a quantity of wood flakes,

means for feeding wood flakes from said holding means to said supporting surface and for causing said flakes to be aligned in substantially parallel side-by-side relation, said means for feeding and aligning including

means defining a plurality of downwardly sloping adjacent side-by-side channels, said channels each including an upper end positioned beneath said holding means and adapted to receive wood flakes from said holding means, and a lower end positioned above said supporting surface, each of said channels including opposed side walls, said side walls having upper edges and lower edges, said side walls each sloping upwardly and outwardly from said lower edges such that said upper edges are mutually spaced apart, and



said channels converging in width from said upper ends to said lower ends so that wood flakes deposited from said hopper converge as they move down said channels,

means for causing wood flakes in said holding means to be deposited in the upper ends of said channels,

means for directing air jets down said channels for causing movement of flakes in said upper ends down said channels, and

means positioned between said lower ends of said channels and said supporting surface for maintaining mutually parallel alignment of said wood flakes as said wood flakes are deposited by the lower end of said channels onto said supporting surface, said means for maintaining alignment including a plurality of parallel closely spaced parallel baffles, said baffles defining vertical planes substantially parallel to the longitudinal axis of the loosely felted mat being formed.

4,505,372

DEVICE FOR SUPPLYING PIECE TO BIAXIAL ORIENTATION BLOW MOLDING MACHINE

Nobuo Sato, Funabashi, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1979, Ser. No. 32,742
Claims priority, application Japan, Apr. 24, 1978, 53-48572
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—404 **14 Claims**

1. A device for supplying an injection-molded, bottomed cylindrical piece in upward opening attitude to a biaxial orientation blow molding machine by inverting the piece 180° into a downward opening attitude and dropping the piece onto a mandrel to assemble the piece with the mandrel, comprising:

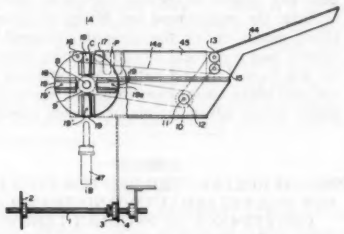
two conveyor belts for conveying the piece in said upward opening attitude by interposing the neck of the piece therebetween;

piece conveying means at the conveying end of said conveyor belts;

an inverting table having a radius at least larger than the length of the piece and open radially extending piece guide recesses for containing and holding the piece, said inverting table being disposed in vertical attitude to face said piece conveying means at one surface thereof, said table being intermittently rotatable at every 90° to position one of said guide recesses in receiving relationship with said piece conveying means;

holding means for retaining said piece in said piece guide recesses until said piece arrives at a piece dropping position;

an inserting plate for horizontally moving the piece con-



veyed by said piece conveying means and inserting the piece into the piece guide recess facing said piece conveying means;

a first cam mechanism for moving said inserting plate back and forth;

a stopper plate for dropping the piece from the piece guide recess disposed at said piece dropping position inverted 180° from the inserting position of the piece to assemble the piece with a mandrel directly thereunder; and

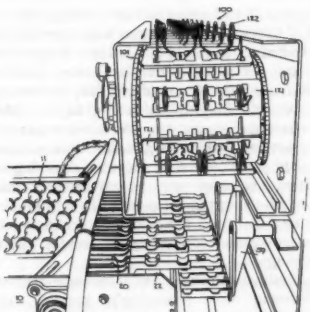
a second cam mechanism for slidably moving said stopper plate.

4,505,373

EGG TRANSFER SYSTEM

Leslie P. Thomas, Canton, Mich., assignor to Diamond Automations, Inc., Framington, Mich.

Filed Jul. 1, 1982, Ser. No. 394,443
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—432 **45 Claims**



1. An egg transfer system adapted to move an egg through a weighing station which comprises:

a first egg holding station onto which the egg is fed;

an egg weighing station disposed in line with and downstream of said first egg holding station;

a second egg holding station disposed in line with and downstream of said weighing station;

advancing means rotatably movable with respect to each of said stations adapted to engage an egg from the underside during the rotary movement thereof and advance the egg from one station to another; and

lifting means adapted to engage an egg from the underside thereof and lift the egg from said second holding station, said lifting means being rotationally and reciprocally movable with respect to said second egg holding station, said rotational movement thereof being about an axis generally parallel to the line formed by said stations to facilitate the engagement and lifting of the egg by said lifting means during the upward rotational movement thereof, said reciprocal movement being generally along the line formed by said stations and sufficient to reciprocate said lifting means away from said second egg holding station as said advancing means is being moved thereto.

4,505,374

APPROACH ROLLER FEED BED FOR COOLING BEDS FOR THE RETARDATION AND TRANSVERSE CONVEYANCE OF PRODUCT LENGTHS

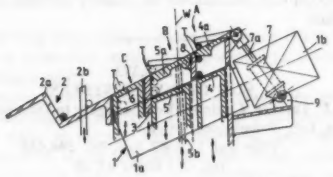
Hügo Beerens, Meersbusch; Hugo Feldmann, Alsdorf; Theodor Gipperich, Dusseldorf; Hans Kirchhoff, Krefeld; Siegfried Küsel, Dusseldorf; Claus G. Schlanzke, Ratingen-Eckamp, and Dieter Nobis, Neuss, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 24, 1982, Ser. No. 391,878

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1981, 3126811

Int. Cl.³ B65G *47/26*

U.S. Cl. 198—448 **20 Claims**



1. In an approach roller feed bed for cooling beds for lengths of product of varying cross-sections and approach speeds, in which a strand of rolled stock, divided into lengths, is fed in an axial direction, including conveyor rollers inclined transversely with respect to the conveying line, the feed bed being divided into an inner longitudinal section adjacent the cooling bed for the retardation and transverse conveyance of thick profile cross-sections, and a longitudinal section spaced from the cooling bed and covered by movable covering means for the retardation and transverse conveyance of thin profile cross-sections, the longitudinal sections having braking means which may be raised and lowered independently of one another for retarding and conveying the lengths, the improvement comprising:

three longitudinal retarding and transverse conveying sections forming three substantially parallel longitudinal channels substantially aligned with the longitudinal axis of the conveying line, comprised of an inner channel adjacent the cooling bed, a central channel adjacent said inner channel and an outer channel adjacent said central channel on the side opposite said inner channel, said channels being disposed in the region within the width of the conveyor rollers;

braking means in each channel beteen said conveyor rollers;

means to raise and lower said braking means between a raised position above the upper surfaces of said rollers to lift the rolled stock length off said rollers and retard their axial travel, and a lower position below the upper surface of said rollers;

a first channel wall separating means between said inner and central channels;

means to raise and lower said first separating means between a raised position above the upper surface of said rollers and a lower position below the upper surface of said rollers;

a second channel wall separation means between said central and outer channels;

movable covering means for each said central and outer channels;

means to open and close said covering means;

said central channel forming an approach channel for said inner channel when said braking means of said central channel is in the lower position; and

said braking means for said central and outer channels being operable alternately to transversely convey said lengths of rolled stock toward said inner channel.

4,505,375

APPARATUS FOR CONVEYING FLAT GOODS ONE SIDE OF WHICH BEARS A LIQUID LAYER

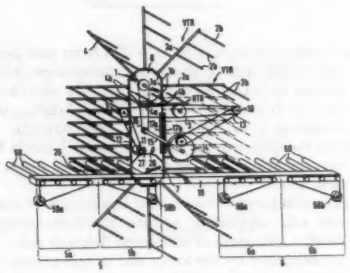
Kaspar Kuster, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 12, 1982, Ser. No. 397,372

Claims priority, application Switzerland, Jul. 20, 1981, 4746/81

Int. Cl.³ B65G *37/00*

U.S. Cl. 198—482 **5 Claims**



1. An apparatus for conveying flat goods such as plates, sheets, films and the like one side of which goods bears a liquid layer to be solidified, said apparatus comprising

conveyor means movable along an ascending and a descending stretch as well as along a substantially horizontal stretch therebetween, and

carrier means connected to said conveyor means and being adapted for carrying said goods always in horizontal position while conveying them along said stretches;

wherein said conveyor means comprises

a single endless first chain composed of links and joints and adapted for moving in a plane along said ascending and descending stretches and along an upper and a lower direction-reversing stretch, from one of the two former stretches to the other, respectively; and

transverse conveying means for traveling over said substantially horizontal stretch;

and wherein a first group of said carrier means consist of fork-shaped carriers comprising each a carrier bar and a number of prongs mounted on said carrier bar and protruding at a right angle from the latter, each of said carrier bars being attached in such a manner to a link of said first chain, outwardly of, and parallel with, the plane in which said first chain runs, that the fork-shaped carrier remains

in horizontal position while being transported by said first chain along said ascending and descending stretches; and

said carrier means further comprise at least one transversely conveyed fork-shaped carrier of similar construction as the carriers of said first group, the carrier bar of each such transversely conveyed carrier being engaged by said transverse conveying means for movement therewith, and

parallelogram-guiding means associated with said transverse conveying means and said at least one transversely conveyed carrier for guiding the latter carrier in an elliptic movement, thereby maintaining the same at all times in horizontal position;

said transversely conveyed carrier being so arranged with regard to said carriers of said first group, as well as the kinematics of said at least one transversely conveyed carrier and all carriers of said first group being so adjusted with respect to each other, that the prongs of the carriers of said first group, on the one hand, and the prongs of said at least one transversely conveyed carrier are staggered relative to each other, and that

said at least one transversely conveyed carrier overtakes an ascending one of said carriers of said first group immediately before, and overtakes a descending one of these last-mentioned carriers immediately after, such carrier of said first group enters or leaves, respectively, said upper direction-reversing stretch,

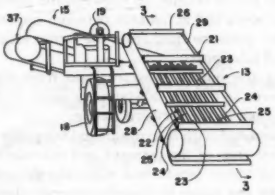
whereby flat goods resting on said ascending carrier are lifted off the latter by the upwardly overtaking transversely conveyed carrier, and whereby the same goods are re-deposited by said transversely conveyed carrier on to said descending carrier, of said first group, being overtaken in a downward direction.

4,505,376

ROCK LOADING APPARATUS

Colonel N. Bynum, P.O. Box 455, Choteau, Mont. 59422

Filed Dec. 21, 1982, Ser. No. 451,232
Int. Cl.³ B65G *65/06*
U.S. Cl. 198—520 **6 Claims**



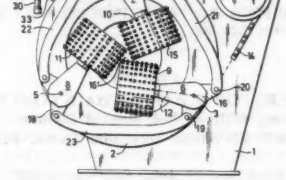
1. Rock loading apparatus including a frame portion, a rock collecting portion, a rock storing portion and a rock dispensing portion; said frame portion including a wheeled carriage section and an operator's station, said operator's station being located adjacent the intersection of said rock collecting portion and said rock dispensing portion to monitor continuously the movement of rocks through said apparatus; said rock collecting portion including a first conveying section, said first conveying section being disposed in an inclined plane, said first conveying section including a first rock supporting surface, said first rock supporting surface including a plurality of spaced rod members disposed generally longitudinally of the direction of movement of said first conveying section, said rod members being disposed in the same plane at the lower end of said first conveying section and at the upper end thereof alternate rod members being offset in separate planes to divert rocks moving upwardly therealong into a plurality of separate channels, first continuous drive means disposed along both longitudinal sides of said first conveying section, a plurality of spaced bar members extending between and being attached to said continuous drive means, each of said bar members including a surface disposed in a plane substantially perpendicular to said first rock supporting surface of said first conveying section, said bar members being in a rock contacting position when disposed along the lower length of said first conveying section; said rock storing portion including a hopper section, said hopper section including an upper opening and a lower opening, said upper opening being disposed closely adjacent to the upper end of said rock collecting portion; said rock dispensing portion including a second conveying section, said second conveying section including a second rock supporting surface, said second rock supporting surface being disposed closely adjacent to said lower opening of said hopper section, said second conveying section being movable in a direction transversely to the movement of said first conveying section and second drive means for said second conveying section; whereby said rock loading apparatus is movable to a collection of rocks, said rocks are moved upwardly along said first conveying section, discharged into said rock storing portion and periodically transferred from said storing portion and along said second conveying section.

4,505,377

ARRANGEMENT IN LOG-FEEDING APPARATUS

Erik Sundberg, Hofors, Sweden, assignor to Waller Innovation AB of Falufagen 22, Sweden

Filed Apr. 29, 1983, Ser. No. 490,035
Claims priority, application Sweden, May 18, 1982, 8203150
Int. Cl.³ B65G *29/00*
U.S. Cl. 198—624 **4 Claims**



1. An arrangement in log-feeding apparatus of the kind comprising at least three driven feed rollers (**9, 10, 11**) mounted on feed arms (**6, 7, 8**) of mutually equal length, said feed rollers forming therebetween a log-receiving space (**16**), the end portions of each feed arm being pivitally mounted at a location on a circular line on a carrier (**2**) arranged to be guided by means of a linkage system (**16, 17, 18, 21, 22, 23**) which is connected to the piston rod (**24**) of a main, hydraulic piston-cylinder device (**25**), so that when the piston rod is extended from and withdrawn into said cylinder the rollers are swung towards and away from each other respectively, characterized in that the free end of the main hydraulic cylinder is pivotally connected to a slide (**37**) in a slide guide (**32, 34, 36**), and in that adjustment means (**30, 39**) are provided for displacing the slide (**37**), therewith to change the distance between the connection point (**29**) of the main hydraulic cylinder on the slide and connection point (**27**) of the piston rod (**24**) of the main cylinder (**25**) on the linkage system.

4,505,378

CONVEYOR POCKET GRIPPING APPARATUS

George M. Statkus, Chicago, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 17, 1982, Ser. No. 450,586
Int. Cl.³ B65G *17/36, 21/00*
U.S. Cl. 198—710 **4 Claims**

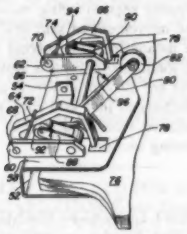
1. A conveyor apparatus for successively receiving and

retaining single newspapers being independently advanced by a conveyor loading device and independently delivering them to a predetermined location for further processing, said conveyor apparatus comprising:

(a) an endless conveyor track;

(b) a conveyor chain mounted within and for travel about the extent of said endless conveyor track;

(c) a multiplicity of pocket members having walls defining a generally U-shaped configuration operatively connected to said conveyor chain for movement therewith about the exterior surface of said endless conveyor track;



(d) means pivotally mounted on an external surface of a pocket wall and having means extending through said wall to engage single newspapers received from the conveyor loading device;

(e) means biasing said pivotally mounted means toward a position causing a gripping of a newspaper in said pocket

(f) actuating means mounted on said pocket and connected to said engaging means for effecting movement thereof to a non-gripping position for releasing a newspaper from said pocket member.

4,505,379

SCRAPERS FOR SCRAPER-CHAIN CONVEYORS

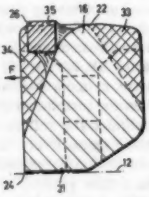
Helmüt Temme, Waltrop, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Nov. 17, 1982, Ser. No. 442,327

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147076

Int. Cl.³ B65G *19/24*

U.S. Cl. 198—731 **10 Claims**



1. In a scraper-chain conveyor for mineral mining of the type wherein a scraper-chain assembly is driven along upper and lower runs defined by side walls and floor plates of individual pans joined end-to-end and the lower run is closed off by means of base plates; improved scrapers (16) for the scraper-chain assembly each comprising a one-piece solid component with shaped end regions (18) for securing to chains (15) of the scraper-chain assembly and a central working region with an upstanding front face (20) relative to said floor plates (12) which defines the height of the scraper, a flat lower face (21) for sliding along the floor plates, the front and lower faces extending substantially perpendicular to one another to define a first scraping edge (24) where said faces meet, an upper face (22) at least part of which is substantially parallel to the lower face and extends over a similar area to the lower face, the upper face serving for sliding along the base plates (13), the upper and front faces (20, 22) also extending substantially perpendicular to one another, a second scraping edge (26) defined at or near a juncture of the front and upper faces, and upper and lower rear faces (28, 29) which extend at an angle to and merge with the upper and lower faces respectively to relieve a rear side (23) of the scraper; whereby the scrapers transport bulk material along the floor plates with their first scraping edges (24) in the upper run (25) and the scrapers transport fine material along the base plates in the lower run (27) with the second scraping edges (26).

4,505,380

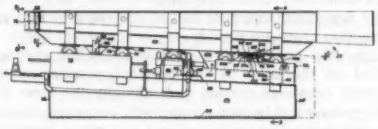
FLUID PRESSURE OPERATED RECIPROCATING CONVEYOR

Michael McLemore, and Ronald Chandler, both of Peoria, Ill., assignors to Central Mfg., Inc., Peoria, Ill.

Filed Aug. 24, 1983, Ser. No. 526,006

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—750 **13 Claims**



1. A fluid pressure operated reciprocating conveyor comprising:

a base;

an elongated conveyor trough reciprocably mounted on the base;

drive cylinder means connected to the trough having opposed inlet ports alternately pressurizable to reciprocate the trough through a stroking range in forward and rearward strokes;

constant volume output pump means;

reversing valve means connected between the pump means and the inlet ports and actuatable between opposite positions to direct pressure fluid from the pump means alternately to said inlet ports;

means enabling the output pressure fluid from the pump means to move the trough substantially faster in the rearward stroke than in the forward stroke;

limit means associated with the trough and trippable thereby at the terminal ends of the forward and rearward strokes to actuate the valve means and alternate the inlet port pressurized by the pump to thereby reverse direction of the trough; and

relief valve means connected to the drive cylinder means and effective to divert a diminishing portion of the output of the pump means from the drive cylinder means during an initial portion of the forward stroke to thereby provide an increasing flow of fluid into the cylinder means and accelerate the trough during the initial portion of the forward stroke.

4,505,381

CONVEYOR ROLLER

Harry Major, Grosse Pte. Woods, Mich., assignor to Harry Major Machine and Tool Co., Fraser, Mich.

Continuation of Ser. No. 496,927, May 23, 1983, abandoned. This application Jun. 25, 1984, Ser. No. 623,633

Int. Cl.³ B65G *13/00, 39/00*

U.S. Cl. 198—781 **3 Claims**

1. In a roller conveyor comprising a frame, a plurality of conveyor roller means rotatably mounted in said frame and cooperatively defining an article conveying path lying in an approximate first general plane commonly tangent to the up-

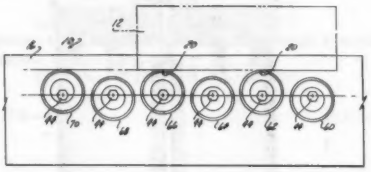
permost surfaces of said roller means, and drive means for driving said roller means in coordinated rotation to advance articles supported upon said roller means along said path;

the improvement wherein each of the said plurality of roller means comprises:

a roller drive shaft mounted in said frame for rotation about its shaft axis,

a cylindrical inner roller member mounted on said shaft for rotation therewith with the axis of said inner roller member fixedly located in parallel offset eccentric relationship to the shaft axis,

and a hollow cylindrical outer roller member coaxially received upon said inner roller member and frictionally engaged therewith,



and wherein a first group of said roller means are coupled to said drive means for in-phase eccentric rotation about their shaft axes with said shaft axes lying in a common general plane parallel to said first general plane, and a second group of said roller means are coupled to said drive means for in-phase eccentric rotation about their shaft axes with said shaft axes parallel to the axes of said first group of roller means and lying in said common general plane, the roller means of said second group being interposed between the roller means of said first group and the phase of rotation of said second group of roller means differing from the phase of rotation of said first group whereby said first general plane of said conveying path is alternately defined by said first and by said second group of roller means as said roller means are driven in rotation by said drive means

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4,505,382

BELT CONVEYOR

Dominique Mareau, Saint Martin D'Heres, France, assignor to Gimar S.A., Eybens, France

Filed Jan. 12, 1983, Ser. No. 457,343

Claims priority, application France, Jan. 19, 1982, 82 00942

Int. Cl.³ B65G *15/08*

U.S. Cl. 198—819 **6 Claims**

1. A belt conveyor, comprising:

(a) an endless belt having a central portion and having two transversely spaced sides;

(b) plural belt supporting drums mutually spaced longitudinally of the belt, the belt lying in an open substantially flat profile where it enters and leaves the drums;

(c) two funicular members spaced transversely of the belt adjacent to its respective sides;

(d) roller means located between the longitudinally spaced drums and engaging the sides of the belt and bringing them close to each other, whereby to rotate the sides of the belt from said flat profile to a substantially vertical orientation, wherein the central portion of the belt assumes a substantially closed-loop elongated bag profile; and

(e) each side of the belt having a thickened bead having a longitudinal bore extending therewithin to receive a funicular member and each bead having a slot extending outwardly through the bead from the bore through which to pass a funicular member, the bead being free to rotate about the funicular member as the belt is deflected between its flat profile and its closed-loop profile without communicating torsional strain between the bead and the funicular member.

4,505,383

EDGE GUARD MEANS FOR A LINK BELT AND A LINK BELT EMBODYING SUCH MEANS

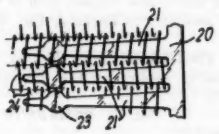
John B. Wheeldon, Fowey; John Jeffery, and Paul F. Myerscough, both of Blackburn, all of England, assignors to Scapa-Porritt Limited, Blackburn, England

Filed Dec. 8, 1981, Ser. No. 328,637

Claims priority, application United Kingdom, Dec. 9, 1980, 8039369

Int. Cl.³ B65G *17/38*

U.S. Cl. 198—853 **24 Claims**



1. A link belt comprising a multiplicity of helical coils of a polymeric material arranged in interdigitated side-by-side relationship, and guard means comprising a flexible body part and mounting means therefor, the mounting means extending coaxially with and only partially into a coil of the belt and adapted to be retained therein, so as to locate the said body part in opposed disposition relative to and adjacent a belt edge defined by the respective, substantially aligned ends of the said multiplicity of coils so as to at least partially overlie said ends to protect the said edge against wear and/or damage.

4,505,384

OVERWRAPPED WINDOW CARTON AND BLANK

Raymond G. Scott, 51 Bradford La., Oak Brook, Ill. 60521, and Irvin W. Sherwood, 5431 Cumnor Rd., Downers Grove, Ill. 60515

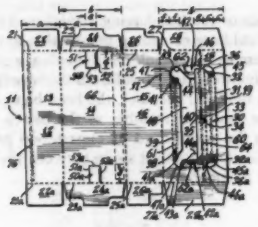
Filed Apr. 12, 1984, Ser. No. 599,635

Int. Cl.³ B65D *25/54*

U.S. Cl. 206—45.33 **15 Claims**

8. A generally planar paperboard blank for forming a window-carton, said blank comprising rectangular first side panel, bottom panel, second side panel, and top panel consecutively articulated to one another along parallel fold lines, said first side panel and top panel being further defined by edges extending parallel to their respective foldable connections to said bottom panel and second side panel, said first side panel, bottom panel, second side panel and top panel each including opposed ends, end flaps articulated respectively to the opposed ends of said first side panel, bottom panel, second side panel and top panel, said top panel including a support flap formed in said top panel and articulated thereto along a support fold line which is parallel to and spaced from said edge of said top panel, said top panel further including a glue lap intermediate

said second side panel and said support flap and articulated to said support flap along a fold line parallel to said support fold line and spaced therefrom a distance substantially equal to a distance between said support fold line and said edge of said



top panel, whereby said support flap and said glue lap may be rotated about said support fold line to define a window in said top panel, and whereby said glue lap can be adhered to said first side panel adjacent the edge thereof to define a tubular carton.

4,505,385

POUCH PACK FOR TOBACCO AS WELL AS A PROCESS AND APPARATUS FOR MAKING THIS

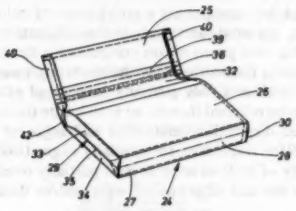
Heinz Focke, and Oskar Balmer, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,614

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1982, 3214240

Int. Cl.³ B65D *85/10*

U.S. Cl. 206—260 **2 Claims**



1. Process for making pouch packs for fibrous material, especially cut tobacco, comprising a multilayer blank made of plastic foils, which forms a pocket with a front wall, a rear wall, a bottom and side walls and, as a continuation of the rear wall, a closure flap, said side walls being perpendicular to said front and said rear wall when the pouch is filled with the fibrous material, an orifice of the pocket being sealed by a closing seam, wherein, after the pocket (24) has been filled with fibrous material, with the blank lying flat and spread out in the region on the orifice (32) of the pocket, the closing seam (36) extending over the entire length of the orifice is made, and then lateral strip-shaped projecting lengths (40, 41) of the closure flap (25) together with edge ends of the closing strip are folded inwardly against the inner side of the closure flap, and wherein, finally, the closure flap together with the inwardly folded projecting lengths (40, 41) is folded over against the front wall (26) of the pocket; wherein for folding in the projecting lengths (40, 41) the closure flap (25) is pivoted into an intermediate position at an angle to the pocket (24), especially at an angle of 45°, and wherein in this position the projecting lengths are folded over against the closure flap whereafter the flap is finally folded against the front wall (26) of the pocket.

4,505,386

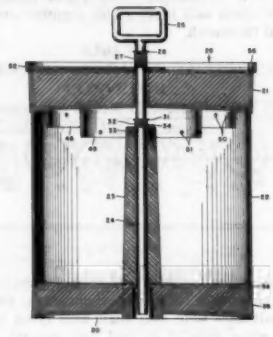
TACKLE BOX

Thomas C. Abrahamson, Ludington, Mich., assignor to Harrington Tool Company, Ludington, Mich.

Filed Oct. 31, 1983, Ser. No. 547,468

Int. Cl.³ B65D *85/00, 51/24*

U.S. Cl. 206—315.11 **6 Claims**



1. A tackle box including upper and lower trays and a protective wall surrounding the space between said trays, wherein the improvement comprises:

a central tubular post secured at the lower extremity thereof to said lower tray perpendicular thereto, said post having at least a portion of the inside surface thereof formed with a keyhole configuration in cross-section providing a radially-extending portion and a surface extending laterally from said radially-extending portion adjacent the lower extremity of said post;

means forming a cap secured to the top of said post, said cap and post together defining a sector chamber communicating with, and extending laterally beyond said radially-extended portion;

a shaft traversing said tubular post, and having a radial pin adapted to traverse said radial extension and said sector chamber, said shaft having a handle at the upper extremity thereof, said shaft traversing said top tray and including abutment means engageable with said top tray to elevate said top tray on raising said handle.

4,505,387

ROLL PACKAGE

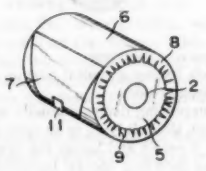
Yoshihiro Seto, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 5, 1984, Ser. No. 627,978

Claims priority, application Japan, Jul. 8, 1983, 58-106304[U]; Dec. 16, 1983, 58-193784[U]

Int. Cl.³ B65D *85/67, 85/671, 85/672*

U.S. Cl. 206—414 **4 Claims**



1. In a package for a roll of strip material coiled in convolu-

tions of increasing radius and having generally flat end surfaces, the improvement comprising:

an end cover for each end surface of the roll;

a circumferential cover adhered to the coiled strip material for covering at least the outer most convolution of the coiled strip material with leaving the outermost end thereof uncovered, said circumferential cover having a pair of side lips extending beyond the respective side edges of the strip and folded over said end covers; and

slits in said side lips extending from the edges of said side lips generally radially of the roll toward, but terminating short of, the outer convolutions of the roll.

4,505,388

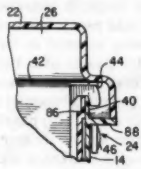
EXPANDABLE PORTABLE FILE

Jack Solomon, Long Beach, N.Y., assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Dec. 8, 1982, Ser. No. 448,034

Int. Cl.³ B65D *85/62*

U.S. Cl. 206—425 **21 Claims**



1. A portable file comprising a case formed with two side panels, a front panel, a back panel, bottom and a top, said two side panels, back panel and bottom forming an integral structure,

first hinge means connecting said integral structure and the rear end of said top and permitting pivoting movement of said top about said hinge means between a closed position and an open position,

second hinge means connecting said integral structure and the bottom of said front panel and permitting pivoting movement of said front panel about said second hinge means between a closed position and an extended position,

latch means connected to said top and front panel whereby they can releaseably be retained in their respective closed positions,

handle means connected to said top whereby it can be carried,

support means formed on said side panels for supporting a plurality of hanging files inside said case, said support means comprising the upper edges of said respective side panels,

retention means comprising a pair of shoulders formed on said top and being spaced apart from said upper edges when said top is in said closed position a distance sufficient to permit said files to hang over said respective upper edges but insufficient to permit said files to become dislodged from said respective upper edges,

said retention means cooperating with said support means for retaining said hanging files on said support means when said top is in said closed position, notwithstanding tipping of said case, and

buttress means cooperating with said side panels and said top for preventing said top from overriding said side panels and front panel when subjected to pressure in the closed position, said buttress means comprising a pair of flanges respectively connected to and extending outwardly from said side panels below the upper edges thereof and a pair of flanges respectively connected to said top at opposite sides thereof, the flanges of one pair respectively abutting the flanges of the other pair in the closed position,

said top being capable of pivoting through an arc exceeding 90°, whereby it rests stably in the open position by virtue of its own weight, and

said front panel being capable of pivoting through an arc such that the top thereof in said extended position swings out a distance sufficient to permit finger access to hanging files stored in said case even when said case is filled to rated capacity.

4,505,389

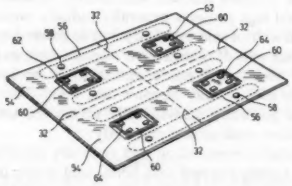
PACKAGE ASSEMBLIES

Michael G. Whiteside, 5200 Dixie Rd., Ste. 118, Mississauga, Ontario M4W 1E4, Canada

Filed Jan. 10, 1984, Ser. No. 569,638

Int. Cl.³ B65D *73/00*

U.S. Cl. 206—460 **7 Claims**



1. A package assembly comprising a rigid base member having at least one pair of parallel lines of weakening defining a tear strip, at least one row of packages positioned on the base member and removably secured to a tear strip by frangible adhesive, and a film of plastic material passing over the packages and secured to the base member to retain the packages in assembly therewith, the packages being removable from the assembly by removing the plastic film, tearing the tear strip from the remainder of the base member, and separating the packages from the tear strip by breaking the frangible adhesive.

4,505,390

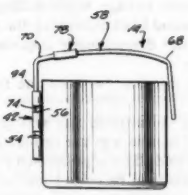
BOTTLE-NESTING CUP WITH THREE-POSITION HANDLE

Ronald K. Kirk, Jr., P.O. Box 535, Franklin, W. Va. 26807

Filed Nov. 22, 1983, Ser. No. 554,388

Int. Cl.³ B65D *25/28*

U.S. Cl. 206—547 **7 Claims**



1. A cup with an adjustably-positioned handle, comprising:

a cup body having a bottom wall with an upstanding peripheral sidewall joined thereto, which sidewall terminates in a rim;

bracket means exteriorly disposed on said sidewall and mounted thereto, said bracket means including means providing at least one pair laterally spaced, laterally opening pintle sockets, the sockets of each pair being disposed at a respective common level; for at least one said pair of sockets, two pair of laterally spaced groove means which open laterally one pair above and the other below said one pair of sockets;

a handle comprising a generally U-shaped wire member of

resilient material, said member having a base portion including a cross member and two generally parallel portions each joined to a respective end of the base portion and having a free end; a laterally directed pintle formed at each said free end, these two pintles extending in opposite directions generally on a common axis; said two generally parallel portions of said wire member being bent intermediate the longitudinal extent thereof at about right angles about an axis generally parallel to said common axis of said pintles so as to provide a bend in said handle and so as to define legs of said handle between said bend and said pintles;

said pintles being removably received in said one pair of pintle sockets, with said legs being constructed and arranged to resiliently snap into one pair of said groove means when said handle is rotated about said pintle means to a use position wherein said handle, beyond said bend from said legs projects generally radially outwards from said sidewall of said cup body and to resiliently snap into said other pair of said groove means when said handle is rotated about said pintle means to a storage position wherein said handle, beyond said bend from said legs projects generally diametrically across the underside of said bottom wall of said cup body;

a slider slidably mounted on said generally parallel portions of said handle beyond said bend, said slider including a substantially incompressible strut extending laterally between said two generally parallel portions and two opposite barrel portions curled about respective ones of said two generally parallel portions, said slider being constructed and arranged to be manually slid between

a first portion nearer said base of said handle, in which case said legs may be resiliently moved close enough together to clear the respective said groove means, so that the handle may be rotated out of whichever of said storage position and use position that it is in, and

a second position nearer said bend, in which case said legs are braced apart and cannot clear the respective said groove means, so that the handle may be locked in whichever of said storage position and said use position that it is in;

said two generally parallel portions of said wire member being provided with a second bend about an axis generally parallel to the first described bend, this second bend also being at about a right angle and being spaced from the first-described bend by a distance that is at least equal to the width of the bottom wall of the cup, so that when the handle is in said storage position thereof, said handle beyond said second bend extends up the outside of the cup sidewall at a site diametrically opposed to that of said bracket means;

said slider being disposed between the first-described and second bends;

said pintles being constructed and arranged to be so short that when said handle legs are resiliently squeezed close together when said slider is positioned close to the second bend, the handle may be completely separated from the cup body, reversed 180 degrees about an axis that is generally radially oriented relative to said cup body sidewall, and said pintles reinstalled in a set of said pintle sockets in this new orientation, whereby said handle may be rotated about said pintles to a third position, the last-mentioned said set of said pintle sockets being so positioned, heightwise, on said bracket means on said cup body sidewall, relative to the lengths of said legs of said handle between said bend and said pintles that, in said third position of said handle, said bend of said handle is disposed at a sufficiently high level in relation to said rim of said cup sidewall that said handle between said bend and said base arches bail-fashion over the cup body;

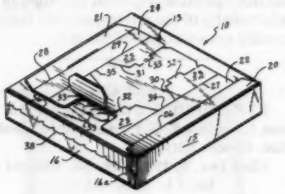
said cup further including means on said cup body for holding said handle in said third position.

4,505,391

COOK-IN CARTON WITH IMPROVED INTEGRAL SUPPORT STRUCTURE

Morris W. Kuchenbecker, Neenah, Wis., assignor to James River-Norwalk, Inc., Norwalk, Conn.

Continuation of Ser. No. 274,803, Jun. 18, 1983, abandoned.
This application Aug. 16, 1983, Ser. No. 523,864
Int. Cl.[3] **B65D** *85/00*; **H05B** *6/64*
U.S. Cl. 206—622 **6 Claims**



1. In a carton for use in heating a product contained therein, including a plurality of hingedly interconnected panels forming said carton, two of said panels being similarly dimensioned and configured and being secured in face-to-face contact to provide inner and outer panels of a two-panel wall in said carton, a central portion of said inner panel having first openings formed therein to permit substantial exposure of the contained product, the outer of said two panels having two lines of weakness extending completely thereacross for defining a centrally located removable weakened section, said removable section being dimensioned and configured to cover said first openings of said inner panel, a pair of rectilinear first score lines, each first score line extending along an opposite region of said outer panel, one rectilinear first score line on each side of said weakened removable section, each first score line located between one end of said outer panel and one of said lines of weakness, for defining two foldable flaps therebetween, the portions of said outer panel between said flaps and the end of said outer panel comprising tabs secured to said inner panel so that, upon removal of said removable section of said outer panel, said flaps may be folded about said first score lines away from said inner panel, thereby providing support legs on said carton, and disengagement of said removable section from the remainder of said outer panel uncovering said first openings and effecting substantial exposure of the product contained within the carton, the improvement comprising:

a second score line on each said flap, extending parallel to each said first score line and located between each said first score line and said line of weakness nearest said first score line; and

at least one locking lug extending from the free edge portion of each of said flaps;

said inner panel having at least two second openings additional to said first openings, said second openings being formed in said inner panel underlying each said flap and being configured for receiving each said lug therein upon folding said flaps away from said inner panel on said first score lines and back towards said inner panel on said second score lines for positively locking each said flap portion into a triangular folded support position with the base of one side of the triangular support being the portion of said inner panel containing said second openings and with the other two sides of the triangular support forming a channel for directing steam into said second openings in said inner panel.

3. A cook-in carton formed of a suitably cut and scored blank, having top and side walls, and a two-panel bottom wall, said bottom wall including an inner panel having an array of venting openings and an outer panel having a weakened section covering some of said openings, opposed flaps covering the remaining openings adjacent said flaps and adherent to the inner panel to mount the outer panel over the openings, and said flaps being foldable about provided first score lines away

from said inner panel upon removal of said weakened section to uncover said openings, in provision of support legs for said carton, wherein the improvement comprises:

a second score line in each said flap parallel to said first score line;

a pair of lugs formed in each said flap upon removal of said weakened section; and

said pair of lugs being insertable into and retained within one pair of said openings aligned therewith, upon folding of each said flap about said first score line and said second score line, away from and then toward said inner panel, thereby providing support legs for said carton.

4,505,392

CARD FRAMES

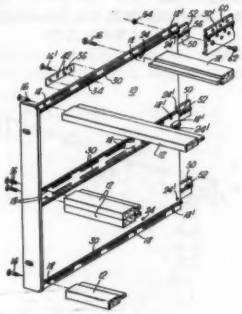
David P. Erlam, Winchester, England, assignor to Rittal-Werk Rudolf LOH GmbH & Co., KG, Herborn, Fed. Rep. of Germany

Filed Jun. 25, 1982, Ser. No. 392,163

Claims priority, application United Kingdom, Jun. 29, 1981, 8119943

Int. Cl.³ A47F *5/10*

U.S. Cl. 211—26 **8 Claims**



1. In a card frame comprising a pair of side plates and a plurality of cross rails secured to and extending between said side plate, the improvement comprising each side plate being die cast and having a ledge cast integrally therewith and extending in a direction from the front to the rear of the side plate, at least one of said cross rails abutting said ledge where the cross rail is secured to the side plate thereby to prevent rotation of the cross rail about its longitudinal axis, at least one slot cast in each side plate in the vicinity of said ledge, and a configuration cast on the face of the side plate remote from said ledge and receiving a plate having therein a plurality of discrete holes whereby an associated cross rail can be secured to the side plate in any one of a plurality of positions by extension of a fastening element through said slot and into engagement with the cross rail via any selected one of said holes in said plate.

4,505,393

KNOCKED-DOWN EASILY-ASSEMBLED CANNING-LID-STERILIZING RACK

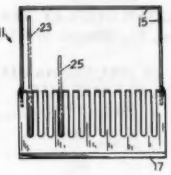
David H. Fleigle, and Phyllis A. Fleigle, both of R.R. 2, Box 120, Moweaqua, Ill. 62550

Filed Sep. 7, 1982, Ser. No. 415,684

Int. Cl.³ A47G *19/08*

U.S. Cl. 211—41 **1 Claim**

1. A sterilizing rack for holding a plurality of conventional canning-lids, comprising: an inverted one-piece trough-shaped sheet-material body having a plurality of spaced parallel transaxial slots therein of a shape and size to hold large and/or small conventional canning lids therein, spaced from each other and from a rack-supporting horizontal surface; said trough-shape defining a crest thereon, wherein said body includes slits at its opposite ends in the area of said crest, each of said slits including opposed edges and, a bail-shaped handle overlying said body and fixed at its extremities to the ends of the crest of said inverted trough-shaped body, said bail-shaped handle being



U-shaped and embracing the sides and one end of said body, and having a pair of oppositely disposed struck-out tongues adjacent each of its ends in snap-together handle-locking engagement with said edges of the respective slits adjacent said slit being received between said respective pair of tongues.

4,505,394

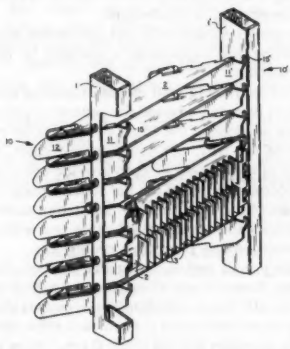
ELECTRICAL APPARATUS FRAME

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Sep. 30, 1982, Ser. No. 431,907

Int. Cl.³ A47G *19/08*

U.S. Cl. 211—41 **8 Claims**



1. An electrical apparatus frame, comprising:

first and second vertical frame uprights parallel to each other;

at least a first pair of support means having a front and rear end, a first one of said first pair of support means attached to said first upright and a second one of said first pair of support means attached to said second upright, each support means of said pair of support means including an upper guide surface oriented in an inclined position, both of said guide surfaces lying within a common support plane;

at least one planar assembly having a front and rear edge, said support means engaging said planar assembly while permitting sliding motion thereof along said inclined guide surfaces therealong, said inclined guide surfaces positioning said planar assembly in a like inclined position to provide convection cooling thereof;

a hook attached to each of said support means, extending from a said front end thereof, said hook positioned below said associated support plane; and

a pair of catches formed in each said planar assembly adja-

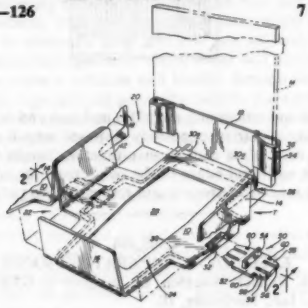
cent the rear edge thereof, each catch engaging a corresponding one of said hooks when said planar assembly is slid out of engagement with said guide surfaces thereby forming a pivot axis to allow said planar assembly to pivot into a vertical plane.

4,505,395

MAGAZINE DISPLAY TRAY

Walter Nathan, Glencoe, Ill., assignor to RTC Industries, Inc., Chicago, Ill.

Filed Jul. 29, 1983, Ser. No. 518,382
Int. Cl.³ A47F 3/14
U.S. Cl. 211—126 **7 Claims**



1. A vending and article display tray for flat articles, such as magazines, comprising, in combination:

means providing a substantially flat, polygonal, support base for receiving and supporting a plurality of flat articles stacked thereon;

a plurality of restraining wall means extending upwardly of the support base and adapted for general aligning cooperation with portions of the edges of the articles stacked on the base of the tray, but being spaced apart, along the periphery of the support base, to provide open corners for manual access to edges of the flat articles along a plurality of the sides of the base, thereby facilitating manual access to the articles and to permit selection and withdrawal of an uppermost article from the vending tray;

the restraining wall means, along one side of the support base, being formed to provide thereon a pair of oppositely facing, laterally spaced, upright clip segments that open in opposing lateral directions toward each other, the spacing of the clip segments and the shape thereof being such as to receive therein spaced edge portions of a flat article, whereby to hold one flat article transverse to the support base in an upright display position.

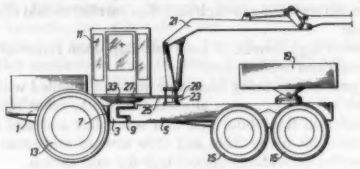
4,505,396

WHEELED WORKING VEHICLE WITH CRANE

Bo P. S. Hedlund, and Eric Arnoldsson, both of Söderhamn, Sweden, assignors to Kockums Industri AB, Söderhamn, Sweden

Filed Mar. 5, 1982, Ser. No. 354,957
Claims priority, application Sweden, Mar. 13, 1981, 8101625
Int. Cl.³ B66C 23/36
U.S. Cl. 212—223 **10 Claims**

1. A wheeled vehicle, especially a forestry machine, comprising a driver's cab and a crane means intended for handling loads, within a working area, rotatably mounted on the vehicle about a substantially vertical axis, said driver's cab being rotatably mounted on the vehicle about a substantially vertical axis horizontally spaced from said rotational axis of the crane, means for rotational control to rotate the cab and the crane means about the horizontally spaced axes such that turning the crane an angle β results in turning the cab an angle α in the same turning direction as the crane to allow an operator to



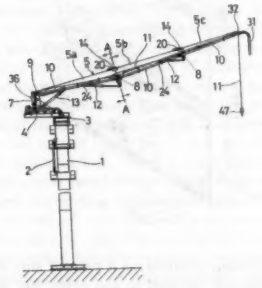
maintain sight of the entire working area of said crane means within his field of view.

4,505,397

APPARATUS FOR HOISTING MATERIALS AND PLACING CONCRETE

Sakichi Isogai, Uraws; Teruo Mizuhata, Kobe; Masaaki Takahashi, Kishiwada; Takayoshi Imai, Sakai; Kazuyoshi Nakanishi, Kogagun; Takefumi Ito, Kobe, and Atsuo Koshihara, Sakai, all of Japan, assignors to Takenaka Komuten Co., Ltd., Osaka, Japan

Filed Mar. 30, 1983, Ser. No. 480,212
Int. Cl.³ B67D 5/00
U.S. Cl. 212—232 **4 Claims**



1. An apparatus for hoisting materials and for placing concrete which comprises:

(a) a non-rotating mast;

(b) a platform mounted at the top of said mast by a rotary connection which comprises means for swinging said platform about said mast axis;

(c) a support frame attached to said platform;

(d) a hoisting winch secured to said platform;

(e) a pin-jointed boom which is attached to said supporting frame in vertically swingable fashion, said boom having a base end and a free end and being foldable only downwardly at said pin joints and comprising a plurality of segments which are pin-jointed in a line, each pin joint including a pair of brackets which project downwardly from ends of adjacent segments;

(f) a line of concrete transport piping which begins at a concrete pump, and then extends alongside the boom from the base end of said boom, through successive pin joints in a substantially zig-zag configuration, towards the free end of said boom, and which terminates in a discharge end which hangs downwardly from said free boom end;

(g) a line of hoisting sling attached at one end to said support frame and extending alongside of said boom from said base end of said boom to a free end of said boom, said hoisting sling hanging downwardly to hold a load-handling block, then extending upwardly and rearwardly back to said base end of said boom, said hoisting sling being wound by said hoisting winch;

(h) means for releasably locking pairs of adjacent boom segments in line in order to strengthen said boom when said boom is used to hoist materials, said locking means being located in spaced, fixed relation above an upper surface of the boom;

(i) at least one sheave comprising means for guiding said hoisting sling line, said sheave projecting outwardly in spaced relation from a respective downwardly projecting bracket at the end of said boom segment, a lower surface of the boom segment which is located at said free boom end having a hook located substantially at a central portion of said lower surface, said hook comprising means for grabbing said load handling block when said apparatus is used as a concrete placer.

4,505,398

TEAT

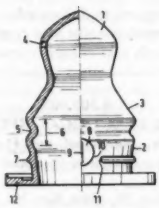
Lutz Kesselring, Zeven, Fed. Rep. of Germany, assignor to MAPA GmbH Gummi- und Plastikwerke, Zeven, Fed. Rep. of Germany

Filed Jan. 24, 1983, Ser. No. 460,363

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1982, 3241845

Int. Cl.³ A61J *11/00, 11/02*

U.S. Cl. 215—11 B **16 Claims**



1. A teat comprising:

an upwardly extending generally cylindrically shaped hollow teat body having an upper end and a lower end and an outside surface and an inside surface,

fixing means provided at the lower end of said teat body,

a nipple having a lower end spaced upwardly from the upper end of said teat body, and

a frusto-conically shaped tapered portion, extending upwardly and inwardly from the upper end of said teat body to the lower end of said nipple,

said teat body has a circumferentially extending recess in the outside surface therof located adjacent the upper end thereof and a circumferentially extending bead in the outside surface thereof spaced below said recess, said recess and bead providing a restricted compression of said teat under downwardly directed pressure applied to said nipple,

said teat body has a cylindrical first wall portion including said recess and said first wall portion has a uniform wall thickness,

said bead has an interrrupted section extending in the circumferential direction, a venting valve formed in said interrupted section and comprising a depression formed in the outside surface of said teat body in said interrupted section of said bead and a slot formed in said teat body within said depression for venting the interior of said teat.

4,505,399

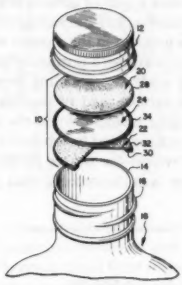
TAMPER-INDICATING DEVICE AND METHOD

Robert C. Weiner, c/o Wright State University, 3640 Colonel Glenn Hwy., Dayton, Ohio 45435

Filed Jun. 21, 1984, Ser. No. 622,814

Int. Cl.³ B65D *31/02*

U.S. Cl. 215—230 **16 Claims**



1. A tamper-indicating device comprising:

a lower impermeable sheet shaped to be attached at an underside thereof to a lower closure member;

an intermediate sheet superposed to said lower sheet and including means on an upper surface thereof sensitive to an ambient condition, said sensitive means adapted to effect a time-delayed change in appearance of said upper surface in response to exposure to the ambient condition;

an upper impermeable sheet superposed to said intermediate sheet and shaped to be attached at an upper surface thereof to an upper closure member;

first adhesive means for attaching said lower sheet to a lower closure member and to said intermediate sheet, and for attaching said upper sheet to an upper closure member; and

second adhesive means, weaker than said first adhesive means, for joining said upper surface of said intermediate sheet to an underside of said upper sheet at outer peripheries thereof to form a substantially impermeable seal.

4,505,400

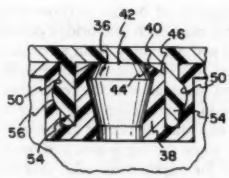
SLIDE TYPE CAP CLOSURE

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425

Filed Mar. 22, 1983, Ser. No. 477,773

Int. Cl.³ B65D *47/28*

U.S. Cl. 215—250 **36 Claims**



1. A slide type closure device for mounting to a vessel containing a fluid, the vessel having an open neck for passage of the fluid, the closure device to seal the vessel when the device is in a closed position and to allow dispensing of the fluid when the device is in an open position, comprising:

(A) A closure member having means for sealing attachment to the neck portion of the vessel, said member having an upper substantially planar surface and an orifice forming member extending upwardly above the planar surface,

and further comprising a pair of substantially parallel grooves formed within a recess in the planar upper surface of the closure member for slidably capturing a second member; and

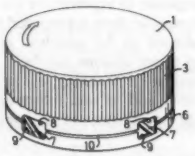
(B) a disk member as said second member having a lower substantially planar surface for contacting a portion of the planar upper surface of the closure member, the disk member comprises a pair of downwardly depending rails each having a transversely projecting ridge for interfitting with one of the grooves in the closure member so as to be able to slide across at least a portion of the closure member planar surface without extending beyond the closure member planar surface, and further to sealingly depress the orifice forming member when the disk member is in the first closed position and to substantially unobstruct the orifice formed within the orifice forming member when the disk member is in the second open position.

4,505,401

SCREW CAP WITH SECURITY RING

Jan Berglund, Västra Frölunda, Sweden, assignor to Wicanders AB, Sweden

Filed Aug. 24, 1983, Ser. No. 526,030
Claims priority, application Sweden, Jun. 1, 1983, 8303099
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 **13 Claims**



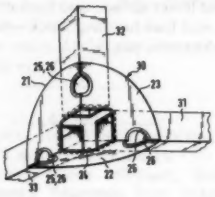
1. A screw cap for a screw threaded container neck, the cap comprising an internally threaded cap portion having a head and a skirt extending from said head to a skirt edge, and further comprising a security ring adjoining said skirt edge and having an edge opposing said skirt edge, the security ring effectively constituting a continuation of said skirt, away from said head, beyond said skirt edge, at least one of said opposing edges of the skirt and the security ring having a plurality of recesses open towards the other said edge, said recesses being distributed around the circumference of the cap, the cap further including a plurality of bridge portions connecting the cap with the security ring, each said bridge portion being disposed in a said recess and extending from a respective first point on the security ring to a respective second point on the cap skirt which is located in advance of the respective first point in the rotational sense in which, according to the internal threading of the cap, the cap must be turned to screw it onto a container neck, whereby when the cap is screwed onto a container neck having a collar for engagement with said security ring, after the security ring engages said collar, further screwing on of the cap will cause the skirt edge of the cap skirt to press against the opposing edge of the security ring after, at most, relatively slight bending of the bridge portions at said first and second points, to allow the cap portion to force the security ring past said collar, whilst after the cap has been fully screwed onto a container and neck and is subsequently unscrewed therefrom, after the security ring engages said collar to be retained thereby, the bridge portions will be subjected to relatively great bending at said first and second points whilst being tensioned and thereby fractured.

4,505,402

FREIGHT CONTAINER AND CORNER FITTING THEREFOR

Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Westerwälder Eisenwerk Gerhard GmbH, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,408
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222763; Oct. 26, 1982, 3239620
Int. Cl.³ B65D *88/00*
U.S. Cl. 220—1.5 **17 Claims**



1. A corner fitting for a freight container comprising

three mutually perpendicular wall members defining three sides of a cube corner,

a corner opening means common to all three of said wall members for accommodating fork lift members for handling said container, and

three edge hole means each being common to a pair of adjacent wall members for accommodating, in conjunction with said corner opening means, hooks for handling said container,

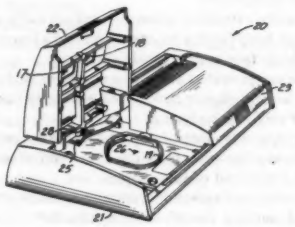
said corner opening and said three edge holes being disposed substantially symmetrically to a container body diagonal extending through said corner opening.

4,505,403

WEATHERPROOF ELECTRICAL RECEPTACLE COVER

Wade R. Bowden, Jr., Northport, and David Herzfeld, Hicksville, both of N.Y., assignors to Slater Electric, Inc., Glen Cove, N.Y.

Filed May 29, 1984, Ser. No. 614,767
Int. Cl.³ H02G *3/14*
U.S. Cl. 220—242 **14 Claims**



1. A weatherproof cover for attachment to the face of an electrical outlet box which comprises;

a generally rectangular base plate having three side walls surrounding and substantially perpendicular to said base plate, wherein one of said walls adjoins the remaining two walls and a plurality of apertures in said base plate for providing access to an electrical device;

a butterfly biasing member having a flat surface disposed at each distal end and engaged with the base plate at the midpoint of the spring;

a plurality of lids with bosses protruding from each side, the bosses of said lids engaging slots formed at the two cor-

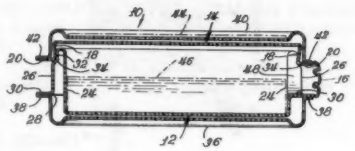
ners formed between the adjoining wall and the other side walls and at a slot formed at the midpoint of the adjoining wall, said lids further including cams for cooperating with the flat surfaces disposed at the distal ends of the butterfly biasing member to exert a force on said lids such that the lids are held in close proximity to said base plate to form a weatherproof seal.

4,505,404

CONTAINER WITH INTEGRAL CLOSURE

William C. Perchak, Chicago, and Douglas E. Foos, Warrenville, both of Ill., assignors to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Mar. 9, 1984, Ser. No. 587,814
Int. Cl.³ B65D *43/14, 51/04*
U.S. Cl. 220—339 **9 Claims**



1. A container comprising:
a. a unitary bottom part,
b. a unitary top part complementary to said bottom part,
c. said top and bottom parts, when engaged to constitute a closed container, forming an internal compartment, and
d. a hinge connecting said top and bottom parts along one edge thereof,
e. said top part including a first closure element and said bottom part including a second closure element engagable with and complementary to said first closure element,
i. said first closure element comprising a depending leg formed about the peripheral edge of said top part, said leg being directed slightly inwardly toward said compartment and having a lower marginal edge,
ii. said bottom part including an upstanding sidewall formed about the periphery of said bottom part, and said second closure element comprising a recess along the top of said sidewall, said recess being shaped to engage said leg in a snap-lock fashion and including a ledge against which said lower marginal edge of said leg seats when said container is closed.

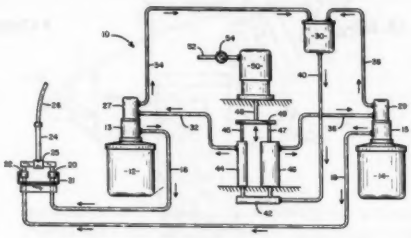
4,505,405

PROPORTIONAL PUMPING SYSTEM

Lawrence S. Kelly, Bolingbrook; Dean L. Schaffran, Carol Stream, and Donald S. Nii, Arlington Heights, all of Ill., assignors to Graco Inc., Minneapolis, Minn.

Filed Jul. 24, 1980, Ser. No. 171,968
Int. Cl.³ F04B *23/06, 13/02, 17/00*
U.S. Cl. 222—135 **5 Claims**

1. A system and apparatus for pumping liquids according to predetermined ratios from at least two liquid reservoirs to a common distribution point, comprising
(a) a reciprocable pump in each liquid reservoir;
(b) a hydraulically reciprocable motor connected to each pump, said motor having ports for intake and exhaust of hydraulic oil;
(c) an oil collection reservoir connected to all of said hydraulic oil exhaust ports;
(d) a plurality of metering and pumping cylinders, one for each hydraulically reciprocable motor,. said cylinders being respectively sized according to predetermined volume ratios and each having a liquid inlet and a liquid outlet, all of said liquid inlets commonly coupled to said oil collection reservoir and each of said liquid outlets respectively connected to a different hydraulic motor intake port;
(e) a reciprocable air-operated motor having a drive member



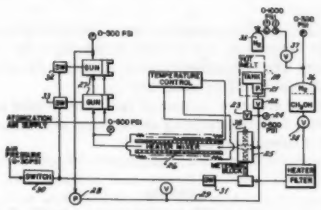
connected in common driving relationship to all of said metering and pumping cylinders; and
(f) means for delivering liquid from respective pumps in said liquid reservoirs to a common distribution point.

4,505,406

METHOD AND APPARATUS FOR DISPENSING LIQUID COMPOSITIONS

Walter H. Cobbs, Jr., Amherst, and William R. Rehman, Vermilion, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 58,837, Jul. 19, 1979,. This application Feb. 12, 1982, Ser. No. 348,208
Int. Cl.³ B67D *5/62*
U.S. Cl. 222—135 **6 Claims**



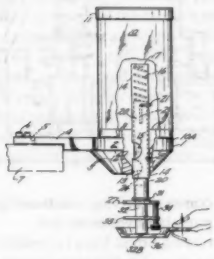
1. An apparatus for dispensing solvent-coating compositions comprising
means for providing a liquid composition comprising a solvent and film-forming solids,
means for transferring a portion of said composition to a separate loop maintained under pressure for circulating said portion,
means for coincidentally heating and mixing said portion in said loop at a temperature above the normal boiling point of at least a portion of said solvent, said composition being maintained under pressure in its liquid state in said loop, and
means for selectively dispensing the composition from the circulating loop to normal atmospheric conditions for evaporation of said solvent portion and for coating a substrate with said film-forming solids wherein said means for providing a liquid composition comprises a container for said solids, a separate supply of solvent and a device to furnish relative amounts of each of said solids and solvent to said loop.

4,505,407

VOLUMETRIC MEASURE FOR GRANULAR MATERIAL

Timothy L. Johnson, Arcata, Calif., assignor to Francis Tool Company, Eugene, Oreg.

Filed Mar. 7, 1983, Ser. No. 473,125
Int. Cl.[3] B67D 5/06
U.S. Cl. 222—181 8 Claims



1. A device for dispensing a desired quantity of particulate material in combination with movable receiving means, said device comprising,

a base,

a hopper on said base to store a quantity of material,

a discharge tube in place on said base and extending into said hopper and defining an intake opening intermediate its ends for the intake of hopper stored material,

a control tube slidably carried by said discharge tube and normally closing said intake opening therein, said control tube defining an intake opening normally out of register with the discharge tube intake opening, axial movement of said control tube serving to communicate the intake openings in the tubes,

a measuring tube telescopically engaged with and depending from said control tube, means regulating the extent of telescopic engagement of said measuring tube with said control tube,

said movable receiving means adapted for closing and opening the lowermost end of the measuring tube and for imparting axial movement to the control and measuring tubes for the filling of same, and

the combined effective volume of said control tube and said measuring tube determining the volume of measured material for subsequent discharge.

4,505,408

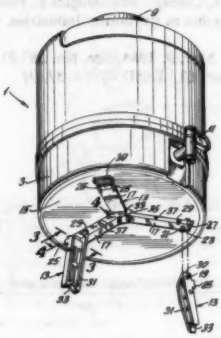
BEVERAGE CONTAINER WITH COLLAPSIBLE LEGS

Sami Sagol, Jaffa, Israel, assignor to Keter Plastic (USA) Inc., New York, N.Y.

Filed Nov. 29, 1983, Ser. No. 556,131
Int. Cl.[3] F16M 11/38
U.S. Cl. 222—185 6 Claims

1. A container for dispensing beverages comprising a cylindrical body having a removable cap at the top thereof and a spigot for dispensing a beverage on a side and near the bottom thereof, at least three collapsible legs pivotally mounted near the outer periphery of the bottom of the container, the bottom of the container forming at least three recesses for receiving said legs extending radially from the center of the bottom and terminating in an end wall near the outer periphery of the container bottom and adapted to house said legs when in a collapsed position, each leg being provided with opposed pins extending outwardly from each side thereof and located near the upper end of each leg when in an upright position, each recess being provided with a pair of opposed inwardly tapered slots terminating beyond lateral holes in the side walls of said slots, said holes receiving the pins on said legs in a pivotal manner, a lateral stop member depending within each recess and disposed at the upper end of each leg when in the upright position and adapted for frictional engagement with the end of each leg to lock same in the upright position and to release same when the leg is manually collapsed and returned to the recess.

6. A collapsible leg structure for a beverage container or the like comprising at least three housing means radially disposed on the base of said container and provided with a top, an outer end wall and side walls, said side walls being provided with holes adapted to receive in pivotal engagement pins extending outwardly on leg members, leg members provided with outwardly extended pins disposed tangentially with respect to the container to pivotally engage said holes, each leg member being provided with an outwardly projecting stop spaced from an outer end thereof to engage said outer end wall and facilitate rotation of said legs on said pins by providing rotational clearance between the outer end of the legs and the outer end walls of said housing means, and a stop member depending from the top of said housing member disposed to frictionally engage the top end of each leg when in an extended position and lock the same in such position.

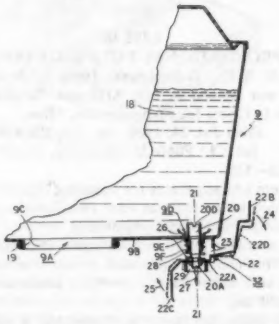


4,505,409

BEVERAGE-DISPENSER VALVE ARRANGEMENTS

Alfred Armstrong, Norwood, Mass., assignor to Crathco, Inc., Canton, Mass.

Filed May 20, 1983, Ser. No. 496,409
Int. Cl.[3] B67D 3/02
U.S. Cl. 222—509 10 Claims



1. Apparatus for valving fluid, comprising means providing an annular valve seat around an opening through a wall of a container for the fluid, an elongated valve member extending through the opening and having a closed inner end disposed within the container for substantially linear movements into and out of seating and sealing relationship with said seat and a

shaped outer end outside the container forming one part of a keying-and-trapping means, said valve member having a reduced cross-sectional area between the seating position of said inner end and said outer end to permit drainage of the fluid when said inner end is moved inwardly out of sealing relationship with said seat, handle means pivoted outside said container and having a tiltable section shaped to form the other part of said keying-and-trapping means and disposed to receive said outer end therein when said valve member has substantially one angular orientation about its longitudinal axis and to trap said outer end for movements therewith when said valve member has significantly different angular orientations, means operable to urge said valve member to assume said different angular orientations and thereby prevent unintended separation of said handle from said outer end of said valve member, and means yieldably urging said valve member along said longitudinal axis and into engagement with said tiltable section of said handle.

4,505,410

FLUID APPLICATOR FOR TREATING GARMENTS

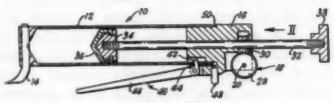
John P. Coulter, 10 Hilton Dr., Shipley, West Yorkshire, England

Filed May 14, 1982, Ser. No. 378,072

Claims priority, application United Kingdom, May 16, 1981, 8115075

Int. Cl.³ B05C *13/02*

U.S. Cl. 222—611 **7 Claims**



1. A fluid dispensing applicator for applying a crease setting composition to a garment comprising: an elongated fluid reservoir; an applicator nozzle connected to the reservoir to deliver fluid therefrom; a support; means for mounting the reservoir on the support to permit sliding movement between the support and the reservoir in a direction parallel to the longitudinal axis of the reservoir; a member rotatably mounted on the support; means responsive to rotation of the member for urging fluid from the reservoir through the nozzle in proportion to the degree of rotation of the rotatable member; a bearing element mounted on the support capable of movement between a retracted and an advanced position relative to the support; the nozzle, the bearing element and the periphery of the rotatable member being mounted on the same side of the applicator and aligned longitudinally therewith, so that each can be placed in simultaneous contact with the garment; coupling means for coupling the bearing elements to the reservoir so that, when the bearing element is forced against the garment, the bearing element is moved from its advanced to its retracted position whereby the reservoir slides towards the support and the fluid in the reservoir is pressurized; and, when the bearing element is not forced against the garment, the bearing element moves from its retracted to its advanced position whereby the reservoir slides away from the support and the fluid in the reservoir is depressurized.

4,505,411

MOTORCYCLE FIREARM CARRIER

Laurie P. Munn, 17544 DuBarry, Bellflower, Calif. 90706

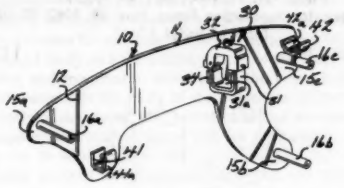
Filed Sep. 16, 1983, Ser. No. 532,837

Int. Cl.³ B62J *9/00*

U.S. Cl. 224—39 **4 Claims**

1. In a motorcycle including a frame provided with a seat for the user and a storage container surrounded by a cage extending from said frame, the improvement comprising:

an adapter inserted between said frame and said cage including spacers connecting said cage to said frame and a support plate secured to said spacers, said support plate including a lock assembly conformed to receive the pump



mechanism of a firearm for opposing the articulation thereof and a front and rear support for aligning the barrel of said firearm received in said lock assembly into alignment subjacent said seat.

4,505,412

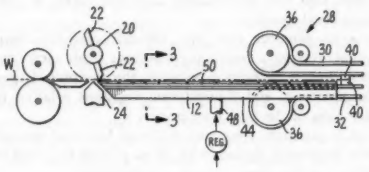
PNEUMATIC CONVEYOR SYSTEM FOR FLEXIBLE WEBS

Imants Reba, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Oct. 31, 1983, Ser. No. 546,779

Int. Cl.³ B65H *29/24*

U.S. Cl. 225—96 **9 Claims**



1. Apparatus for conveying a web of thin flexible material from a first location to a second location along a predetermined plane and direction of web movement comprising, in combination:

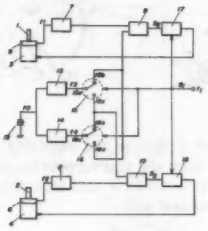
a pair of elongated outer side jet nozzles and a pair of elongated inner side jet nozzles disposed between said first and second locations, each said side jet nozzle having wear surface defining means, flow attachment surface defining means positioned adjacent to said wear surface defining means and aperture defining means positioned between said wear surface defining means and flow surface defining means, said apertures being so configured and positioned as to direct pressurized air emitted therefrom at a direction generally parallel to said plane of web movement and at a predetermined first angle relative to the direction of web movement, and said flow attachment surface defining means slanting away from said apertures to redirect a portion of said pressurized air in a direction diverging from said plane of movement at a second angle due to the Coanda effect, the first angle of said outer side jet nozzles being greater than the first angle of said inner side jet nozzles and the second angle of said outer side jet nozzles being greater than the second angle of said inner side jet nozzles.

4,505,413

DUAL CAPSTAN DRIVE UNIT FOR A TAPE RECORDER

Kazutoshi Kobayashi, Tokorozawa, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed Nov. 14, 1983, Ser. No. 550,797
Claims priority, application Japan, Nov. 29, 1982, 57-209187
Int. Cl.³ B65H 17/42
U.S. Cl. 226—108 1 Claim



1. A dual capstan drive unit for a reversible tape recorder in which a magnetic tape is reversibly transported by first and second capstans in both forward and reverse directions comprising:

said first and second capstans having outer diameters different from each other;

first and second driving means to reversibly rotate said first and second capstans, respectively, in accordance with the direction of the desired tape transport;

means to generate first and second variable frequency signals varying in their frequencies corresponding to the rotational speed of said first and second capstans, respectively, and with frequencies of said generated first and second variable frequency signals being set equal to each other when said first and second capstans rotate at the same peripheral speed;

means to generate first and second reference frequency signals having a frequency different from each other for providing a difference between the peripheral speeds of the upstream and downstream capstans relative to said direction of the tape transport;

means to compare frequencies of said first and second variable frequency signals with those of said first and second reference frequency signals, respectively;

control means to control said first and second driving means so that each frequency of said first and second variable frequency signals substantially coincides with that of said first and second reference frequency signals; and

switching means to switch a comparing correlation between said first and second variable frequency signals and said first and second reference frequency signals in accordance with the direction of the tape transport.

4,505,414

EXPANDABLE ANVIL SURGICAL STAPLER

Charles J. Filipi, 1337 Sturm, Walla Walla, Wash. 99362

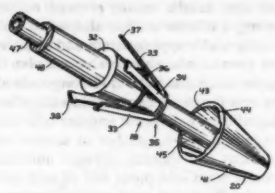
Filed Oct. 12, 1983, Ser. No. 541,155
Int. Cl.³ A61B 17/04
U.S. Cl. 227—19 7 Claims

1. A surgical stapler for stapling two or more layers of tissue together, comprising:

a frame having a staple end and an opposed, handle, end;

an anvil connected to the end of the frame for slidable motion with respect thereto, the anvil having at least one anvil strut having anvil heads thereon for engaging and bending staples forced against the anvil heads; the anvil struts and anvil heads being movable between a collapsed position wherein the anvil struts and anvil heads are drawn radially inward, and an extended position wherein the anvil heads are extended radially outward to engage and bend staples;

means for adjustably moving the anvil heads between the collapsed and extended positions; and



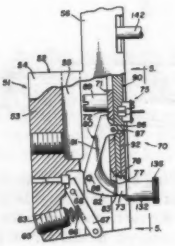
staple driving means adjacent to the anvil for driving staples through layers of tissue and against the anvil heads to crimp the staples and secure the layers of tissue together.

4,505,415

WIRE LOOP STITCHING MACHINE HEAD

Alfred J. Gruen, Chicago, Ill., assignor to Interlake, Inc., Oak Brook, Ill.

Filed Sep. 20, 1982, Ser. No. 420,046
Int. Cl.³ B27F 7/23
U.S. Cl. 227—88 9 Claims



1. A wire loop stitching machine for forming into a staple a length of staple wire held in a forming region and driving the formed staple into an associated workpiece, said stitching machine comprising first forming means engageable with said length of staple wire for forming it into a generally inverted U-shaped staple having a pair of substantially straight parallel leg portions interconnected by a substantially straight bight portion disposed substantially perpendicular to said leg portions, and second forming means cooperating with said first forming means independently of the associated workpiece for engagement with said bight portion of said staple subsequent to the formation thereof to deform said bight portion into a curved loop portion which is concave as viewed from the distal ends of said leg portions.

4,505,416

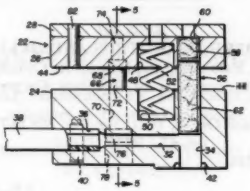
FASTENER INSTALLATION APPARATUS

Jon M. Smallegan, Farmington Hills, Mich., assignor to Multifastener Corporation, Southfield, Mich.

Filed Jul. 13, 1982, Ser. No. 397,757
Int. Cl.³ B21J 15/00; B23P 11/00
U.S. Cl. 227—120 8 Claims

1. An apparatus for installing a self-attaching fastener on a panel, said apparatus having a stationary member for attachment to a die member and a relatively moveable member connected to said stationary member, said moveable member having a first passage for receiving self-piercing fasteners and a transverse plunger passage intersecting said first passage, a plunger connected to said stationary member and projecting therefrom into said moveable member plunger passage, spring

means resiliently biased between said members, and spaced guide bolts generally parallel to and spaced equidistant from said plunger received in parallel coaxially aligned bores in said stationary and moveable members, the connection between said relatively moveable member and said stationary member consisting essentially of said guide bolts, said guide bolts being fastened at one end to said stationary member and having an



enlarged head portion disposed in a counterbore in said moveable member, said guide bolts supporting and permitting limited movement of said moveable member relative to said stationary member against the reaction of said spring means parallel to the axis of said plunger, said guide bolts and said plunger cooperating to guide the movement of said moveable member relative to said stationary member.

4,505,417

MILL FOR MANUFACTURING BODIES OF MULTILAYER HIGH-PRESSURE VESSELS

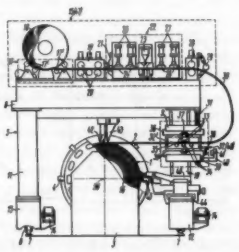
Viktor M. Makarov, ulitsa Sakko i Vantsetti, 58, kv. 35, Sverdlovsk; Boris E. Paton, ulitsa Chkalova, 41a, kv. 26, Kiev; Nikolai K. Globin, ulitsa Griboedova, 20, kv. 64, Sverdlovsk; Viktor G. Usenko, ulitsa Lermontova, 295, kv. 9; Enver R. Khismatulin, ulitsa 4 Zheleznodorozhnaya, 46b, kv. 16, both of Irkutsk; Boris G. Ziselman, ulitsa Inzhenernaya, 71, kv. 45; Petr G. Serov, ulitsa Griboedova, 15, kv. 16, both of Sverdlovsk; Marat M. Shel, ulitsa Kievskaya, 4, kv. 15, Irkutsk, and Ovshiya O. Rozenberg, ulitsa Cheljuskintsev, 15, kv. 40, Kiev, all of U.S.S.R.

PCT No. PCT/SU81/00002, § 371 Date Sep. 9, 1982, § 102(e) Date Sep. 9, 1982, PCT Pub. No. WO82/02350, PCT Pub. Date Jul. 22, 1982

PCT Filed Jan. 15, 1981, Ser. No. 422,900

Int. Cl.³ B23K *31/06*

U.S. Cl. 228—17.7 **2 Claims**



1. A mill for manufacturing bodies of multilayer high-pressure vessels, said mill comprising: a high-pressure vessel having a body in the form of a central pipe including butt end portions; means to rotate the high-pressure vessel, said butt end portions of the high-pressure vessel secured in said rotating means; a technological line for preparation of a steel strip for its winding onto the central pipe, said technological line being movable along the body of the high-pressure vessel, said steel strip coming from a coil; first tensioning means for tensioning the steel strip and pivotally mounted in a plane tangential to the vessel body and at an angle relative to the axis of the vessel body, said angle corresponding to the angle of winding of the steel strip, said tensioning means being also movable axially along the body of the high-pressure vessel and including a plurality of rollers disposed on opposite sides of the steel strip and movable toward and away from each other to change the tension in the strip between the tensioning means and the vessel body; a fixture for welding the steel strip to the end portions of the vessel body and for welding turns of the steel strip to one another and mounted to move along the vessel body; a portal which surrounds the body of the vessel and is movable along the body of the vessel, said portal including an upper platform to support said technological line for preparation of the steel strip for its winding onto the central pipe of the vessel and a crossbar secured to uprights of the portal and movable vertically; said tensioning means carried by and movable along a crossbar that extends along the exterior of the vessel and from which tensioning means the steel strip is supplied to the upper generatrix of the body of the vessel in such a manner that a free loop of the steel strip allows for pivoting of the tensioning means relative to the axis of the vessel body, said free loop formed between the technological line and the tensioning means.

4,505,418

METHOD OF DIRECT BONDING COPPER FOILS TO OXIDE-CERAMIC SUBSTRATES

Arno Neidig, Plankstadt; Dietmar Berndt, Heidelberg; Georg Wahl, Eppelheim, all of Fed. Rep. of Germany, and Mark Wittmer, Baden, Switzerland, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 286,453, Jul. 24, 1981, abandoned. This application Dec. 12, 1983, Ser. No. 561,124

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1980, 3036128

Int. Cl.³ B23K *31/02*

U.S. Cl. 228—122 **5 Claims**

1. Method for the direct bonding of copper foils which carry a copper oxide layer on the surface, to oxide ceramic substrates which comprises disposing a copper foil having a copper oxide layer on the surface on a ceramic substrate with the copper oxide layer in contact with the ceramic substrate, heating the ceramic substrate covered with the copper foil in an oxygen-containing atmosphere to a temperature above the eutectic temperature of Cu and Cu_2O but below the melting temperature of Cu, in a vacuum furnace at a pressure not more than 1 mbar and maintaining a furnace atmosphere with a partial oxygen pressure between 0.001 and 0.1 mbar, and cooling down the heated ceramic substrate during which cooling-down the partial oxygen pressure is kept below 0.005 mbar.

4,505,419

METHOD FOR THE MANUFACTURE OF A HEAT-EXCHANGER HAVING AT LEAST ONE CURVED TUBE OF FLAT CROSS-SECTION

Dieter Steeb, Im Schonenbuhl, CH-9050 Steinegg-Appenzell, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,770

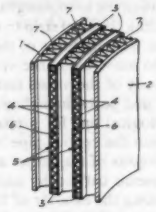
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049168

Int. Cl.³ B23P *15/26*

U.S. Cl. 228—183 **5 Claims**

1. A method of manufacturing a heat exchanger having a longitudinally curved tube of flat cross-section defining a curved flow path for a first fluid wherein said tube is defined by two broad surfaced curved wall elements joined to each other in spaced apart relationship by at least two curved spacing elements disposed between and soldered to said wall elements, said method comprising in combination the steps of cladding with a soldering composition at least one of each of the mating surfaces between said wall and spacing element and applying soldering heat thereto, characterized by the steps of selecting for said cladding a special solder having a range over

which melting occurs, forming a preliminary tube of flat cross-section by assembling broad surfaced wall elements with spacing elements, at least either said wall elements or said spacing elements being pre-clad with said special solder, and effecting



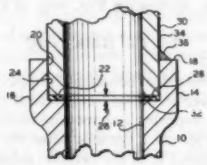
preliminary soldering at a first soldering temperature which lies in the lower part of said melting range, shaping said preliminary tube to form the desired longitudinally curved tube, and thereafter effecting a second soldering of said elements at a second soldering temperature above said first temperature.

4,505,420

WELDING SPACER

Paul G. Wittenbach, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 15, 1983, Ser. No. 466,692
Int. Cl.³ B23K *31/02, 37/04*
U.S. Cl. 228—212 **21 Claims**



1. A method of joining a first pipe having an outer surface and an annular end face and a second pipe having a belled end surrounding an annular shoulder recessed therein, comprising:
(a) inserting a spacer having a predetermined thickness and formed of a synthetic resin material in the blended end of said second pipe adjacent the annular shoulder;
(b) inserting the annular end face of said first pipe in the belled end of said second pipe with the annular end face and the annular shoulder mutually contacting said spacer so that the annular end face and the annular shoulder are spaced apart by a distance substantially equal to the predetermined thickness of said spacer; and
(c) depositing welding metal between the belled end of said second pipe and the outer surface of said first pipe to secure said first pipe to said second pipe with the annular end face of said first pipe spaced from the annular shoulder of said second pipe by said distance, and heating said first and second pipes at the locations of said welding metal to a temperature sufficient to vaporize said spacer and thereby leave a gap between the annular end face of said first pipe and the annular shoulder of said second pipe.

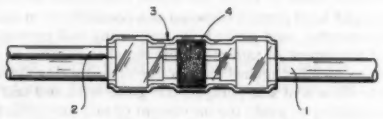
9. A fitting for use in welding to one end of a pipe having an outer surface and a pipe end face, said fitting comprising:
a body of weldable material having a fitting end face;
a passage in said body, said passage including a recess having an inner surface generally conforming to the outer surface of said pipe and communicating with said fitting end face, a shoulder extending inwardly from said inner surface toward the center of said passage, and a second inner surface communicating with said inwardly extending shoulder; and
a spacer disposed within the recess adjacent said shoulder in said body, said spacer having a predetermined thickness and being constructed of a synthetic resin material which will vaporize when subjected to the heat applied to said fitting and said pipe when welding said fitting to said pipe.

4,505,421

SOLDERING METHODS AND DEVICES

Tamar G. Gen, Palo Alto, and Edward A. Cydzik, San Mateo, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 5, 1981, Ser. No. 308,867
Int. Cl.³ B23K *35/36*
U.S. Cl. 228—224 **8 Claims**



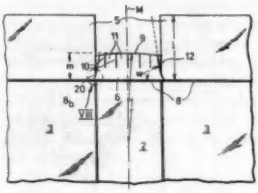
1. A soldering device comprising:
(a) a transparent heat-recoverable polymeric member;
(b) a fusible solder insert positioned within said member; and
(c) a solder flux composition which is associated with said solder insert and which undergoes a visible color change as the soldering temperature; wherein said solder flux undergoes a color change from a colored state to a colorless state.

4,505,422

CONTAINER MADE OF CARDBOARD OR THE LIKE MATERIAL AND BLANK FOR SAID CONTAINER

Franz Vossen, Radolfzell, Fed. Rep. of Germany, assignor to Meurer Non-Food Product GmbH, Radofzell, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,520
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1981, 8133449[U]
Int. Cl.³ B65D *5/02*
U.S. Cl. 229—37 R **11 Claims**



1. A container of cardboard or similar material comprising a base, side walls on said base, flaps foldably connected to the side walls at respective fold line for closing the container, two of said flaps being dust flaps which are adapted for being folded to close the container and two other of said flaps being lid flaps which are foldable on the dust flaps to cover the same, said dust flaps and lid flaps having adjoining edges of conforming shape, the adjoining edges of said dust flaps extending beyond the fold lines between the dust flaps and the respective side walls thereof to form peak regions joined to the fold lines between the lid flaps and associated side walls, said edges of said dust flaps in said peak region being of concave curvature. and means for bonding said flaps together following closing of the container by fold-

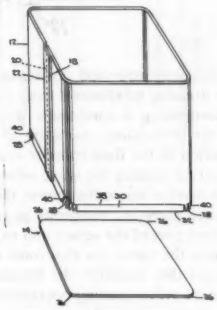
ing the lid flaps on the dust flaps, said peak regions acting to form a dust-tight closure at the resulting corners of the container, the side walls for the dust and lid flaps being at an angle to one another, said dust flaps having free leading edges which are convexly curved, said dust flaps being provided with slits which extend from the leading edges of the dust flaps to form tongues in said dust flaps.

4,505,423

NON-ROUND LIQUID-TIGHT PAPER BOARD CONTAINER

Lev Balanovsky, Philadelphia, Pa., and Arne H. Brauner, Peekskill, N.Y., assignors to International Paper Company, New York, N.Y.

Filed Nov. 12, 1982, Ser. No. 441,291
Int. Cl.³ B65D *3/18*
U.S. Cl. 229—5.5 **12 Claims**



1. A container of paperboard or the like, comprising a side-wall member; and a bottom piece, which defines the bottom of said container;

said side wall member having at least one radiused portion and a bottom edge portion, wherein said bottom edge portion comprises buckling-confinement means in the area of said at least one radiused portion, said buckling-confinement means comprising cut-outs in said bottom edge portion adjacent said bottom edge, said cut-outs comprising V-shaped notches, wherein said bottom edge portion is demarcated from the remainder of said side-wall member by means of a score line approximately parallel to said bottom edge, and wherein said notches extend to a point short of said score line from said bottom edge, said buckling-confinement means further including a slit extending from the vertex of each said notch;

wherein said bottom edge portion of said sidewall member is folded under said bottom piece to define a flange in contact with said bottom piece and sealed thereto throughout a sealing region of said flange; said sealing region having a radially buckled surface and providing a liquid tight seal, wherein said buckling-confinement means limit the buckling that can occur when said bottom edge portion is folded under said bottom piece.

4,505,424

CONTAINER FOR DISPLAYING AND STORING FLAT ARTICLES SELECTIVELY IN FLATTENED OR CYLINDRICAL FORM

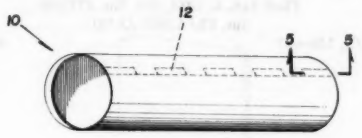
George S. Chappars, 45 Windihill, Greensburg, Pa. 15601

Filed Apr. 13, 1984, Ser. No. 600,116
Int. Cl.³ B65D *85/67, 65/14, 75/02*
U.S. Cl. 229—87 R **14 Claims**

1. A container for retaining a relatively flat article, which container is selectively formed into a cylindrical configuration or into a flattened condition, comprising:

at least two cooperative opposing quadrilateral layers of flexible material constructed and arranged relative to each other in a manner to form a pocket therebetween for receiving and retaining said article, and

adhering means along different opposite edge portions of a first and a second outer surface of said formed pocket when in said flattened form constructed and arranged in a



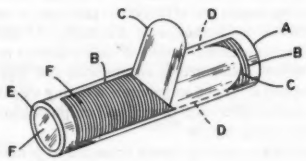
manner that upon an overlapping of said two edge portions causing said first and second surfaces to abut each other for the forming of said cylindrical configuration, said adhering means cooperate with each other to hold said first outer surface along its said edge portion to said second outer surface along its said edge portion to retain said cylindrical configuration.

4,505,425

TEAR OUT STRIP ON COIN TUBES AND COIN WRAPPERS

W. Homer Alsup, P.O. Box 6703, San Francisco, Calif. 94101

Filed Mar. 3, 1983, Ser. No. 471,683
Int. Cl.³ B65D *75/06*
U.S. Cl. 229—87.2 **4 Claims**



1. A coin wrapper or coin tube of flexible nonresilient material having a tear out strip of generally rectangular shape disposed a distance within the margin of the wrapper,

said tear out strip having a width comprising approximately 30% of the circumference of the wrapper in rolled up configuration,

said tear out strip having tear lines along two elongated edges thereof,

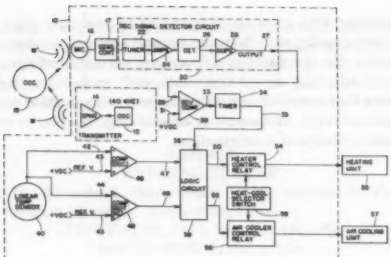
said tear out strip having a curved edge along at least one narrow end thereof,

said wrapper defined a window opening at the curved end of said tear out strip and spaced from the end of the wrapper in rolled up configuration for grasping said tear out strip to remove same at least in part for defining a coin holder from which coins may be readily removed while retaining the remainder of the coins.

4,505,426
ROOM TEMPERATURE CONTROL SYSTEM RESPONSIVE TO MOVEMENT BY OCCUPANT AND TO AMBIENT TEMPERATURE

Vince Rossi, W. Babylon; James R. Miller, Huntington; Leonard P. Tetrault, and Robert R. Tripodi, both of Northport, all of N.Y., assignors to Censor Electronics, Inc., Bay Shore, N.Y.

Filed Feb. 6, 1984, Ser. No. 577,080
Int. Cl.[3] G05D 23/00
U.S. Cl. 236—47 9 Claims



1. A temperature control system for a room in which ambient air temperature is selectively elevated by a space heating unit and lowered by an air cooling unit, comprising:

relay control means for turning said heating unit on and off;

signal generating means for continuously radiating a signal of fixed frequency in said room;

signal receiving means adapted to pick up said radiated signal after reflection of the same from an occupant in said room;

signal detector means connected in circuit with said signal receiving means and arranged to generate an output signal responsive to a change in frequency of said reflected signal upon each movement of said occupant in said room;

timing means connected in circuit with said signal detector means and arranged to generate a timing signal for a fixed time period after each one of said output signals is applied to said timing means;

air temperature sensing means arranged to generate another signal responsive to ambient air temperature in said room;

temperature setting means arranged to generate reference signal corresponding to a desired ambient air temperature in said room when occupied by said occupant;

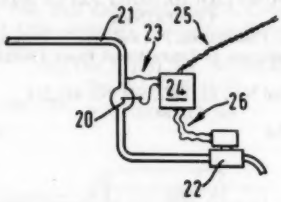
signal comparison means connected in circuit with said temperature sensing means and said temperature setting means for generating control signals responsive to differences in magnitude between said reference signal and said other signal; and

logic circuit means having inputs connected in circuit with said signal comparison means and said timing means, and having an output connected to said relay control means, said logic circuit means being arranged to actuate said relay control means to turn said heating unit on and to keep said heating unit on, and to actuate said relay control means to turn said heating unit off, upon expiration of said fixed time period following the last detection of movement of said occupant in said room.

4,505,427
CONDENSATE DRAIN VALVES

Robert E. Bridges, Toddington, Nr. Cheltenham, England, assignor to 501 Loomhurst Limited, London, England

Filed Oct. 6, 1983, Ser. No. 539,571
Claims priority, application United Kingdom, Oct. 12, 1982, 8229148
Int. Cl.[3] F24D 3/02
U.S. Cl. 236—54 3 Claims



1. An electronically operated condensate drain valve arrangement for draining condensate from a steam system, the arrangement comprising a condensate drain valve, an electronic circuit for controlling operation of the valve, and a sensor for insertion in the fluid transfer system to trigger the electronic circuit for closing the valve when the sensor senses that condensate level is below the sensor, the sensor also serving to sense when there is condensate to be discharged at a level about at least part of the sensor and to thereupon trigger the circuit to open the valve, the electronic circuit including a monitoring circuit that monitors the lengths of the intervals between successive valve opening operations and that triggers the electronic circuit so that the valve opens for a predetermined time and then closes again upon the interval between successive valve opening operations exceeding a predetermined maximum.

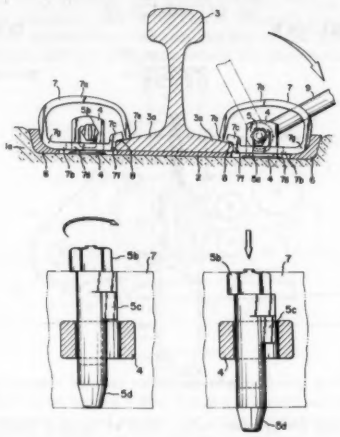
4,505,428
RAIL FASTENING DEVICE

Yoshio Matsuo, and Kentaro Matsubara, both of Tokyo, Japan, assignors to Tetsudo Kizai Kogyo Company Limited, Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,056
Claims priority, application Japan, Nov. 26, 1981, 56-174642[U]
Int. Cl.[3] E01B 9/30
U.S. Cl. 238—349 4 Claims

2. A device for clamping a rail flange to a base, comprising: an anchor mounted in said base and having a head projecting upwardly therefrom with a shaped hole therein having a flat surface, a fastening element mounted in said anchor for rotation about an axis parallel to said rail flange and for sliding motion lengthwise of its rotational axis, a spring member having an upper portion overlying said anchor and a lower portion receiving said upper portion of said anchor, said upper portion terminating in a downward free end engaging said rail flange and said lower portion terminating in a free end adjacent said rail flange, means located outwardly of said anchor supporting said spring member remote from its free ends, said fastening element having a cam lobe for engaging said lower spring portion, a detent surface disposed at an angle relative to said cam lobe, and means for rotating said fastening element, said shaped hole in said anchor head affording rotation of said fastening means to cause said cam lobe to deflect said lower spring portion downwardly and to afford longitudinal sliding

motion of said fastening means in said rotated position for engaging said detent surface with said flat surface in said anchor head hole to prevent inadvertent reverse rotation of said fastening means.



4,505,429

DISPENSER FOR AIR TREATING MATERIAL

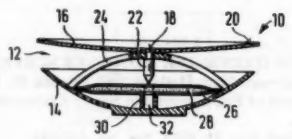
Jean-Pierre Mandon, Chasseneuil-du-Poitou, France, assignor to Airwick Industries, Inc., Carlstadt, N.J.

Filed Mar. 17, 1983, Ser. No. 476,079

Claims priority, application Switzerland, Mar. 26, 1982, 1885/82; May 27, 1982, 3268/82

Int. Cl.³ A61L 9/12

U.S. Cl. 239—56 **3 Claims**



1. A dispenser for an air treating material from which vapours are released into the ambient air through an annular aperture from a round dished base, said dispenser comprising a round dished cover made of an elastic material the top of which curves concavely inwards by exerting pressure on its centre, thereby simultaneously exposing the annular aperture, and which curves convexly outwards by exerting pressure on the periphery, thereby closing the annular aperture again, said dished cover being provided with a spindle in the centre of the inner wall thereof, which spindle traverses a bracket which is made of elastic material and which is secured to two adjacent positions of the dished base, and there being present beneath said bracket a pad of absorbent material containing in the interior thereof a plastic sachet which is impermeable to liquid and which contains a volatile active product in liquid form.

4,505,430

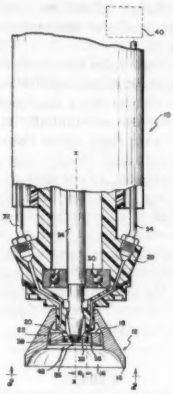
SELF-CLEANING ATOMIZER

Michael C. Rodgers, and Geoffrey H. Michels, both of Indianapolis, Ind., assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Nov. 22, 1982, Ser. No. 443,169

Int. Cl.³ B05B 3/10

U.S. Cl. 239—112 **11 Claims**



1. A rotary atomizer comprising an interior which flares generally outwardly from an axis and which terminates at an atomizing edge from which atomized material is dispensed, a back side which lies generally on the outside of the atomizer and faces generally in the direction opposite the direction in which the interior faces, the atomizer including means defining a passageway extending between and coupling the back side to the interior to provide for delivery of material to the interior to be atomized when the atomizer is revolved on its axis, means for coupling the atomizer to a drive motor, the passageway initiating at a preselected non-zero radius on the back side of the atomizer and terminating in the interior radially inwardly from the preselected radius.

4,505,431

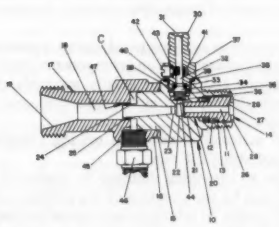
APPARATUS FOR DISCHARGING THREE COMMINGLED FLUIDS

David C. Huffman, Wilton, N.H., assignor to Spraco, Inc., Nashua, N.H.

Filed Jun. 14, 1982, Ser. No. 388,228

Int. Cl.³ B05B 7/04

U.S. Cl. 239—428 **5 Claims**



1. In apparatus for discharging three commingled fluids separately supplied characterized by

i. a body provided with a venturi having an inlet chamber for receiving water under pressure, an outlet portion, and a throat between the inlet chamber and the outlet portion;

ii. the body also being provided with an inlet adapted to receive a liquid other than water and having a through passage the discharge end of which is in direct and immediate communication with the venturi inlet chamber;

iii. a nozzle mounted on the body and having means defining a nozzle discharge passage in communication with the venturi outlet portion; and

iv. means for the admission of air under pressure into the nozzle for discharge therefrom through said nozzle discharge passage into the atmosphere; the improvement which consists of

A. an insert separate from the venturi mounted in the body and having a through passage for receiving water under pressure and also having a discharge end portion terminating downstream substantially at the passage for the discharge of said fluid other than water directly and immediately into said venturi inlet chamber; and

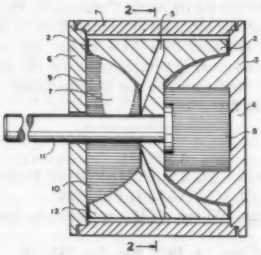
B. the downstream end of the venturi outlet portion being of reduced size extending into the nozzle discharge passage to define an annular gap for air admission between said venturi outlet portion downstream end and said means defining a nozzle discharge passage and terminating downstream beyond and near the area of air admission to the nozzle discharge passage which area is closer to said downstream end than to the upstream end of said venturi outlet portion.

4,505,432

METHOD AND DEVICE FOR FINELY GRANULIZING OF STICKY OR AGGLOMERATED MATERIALS USING CONTROLLED VORTICES

Koycho G. Koev; Aneliya A. Nedelcheva; Yasmina S. Todorova, and Iglika T. Uzunova, all of Varna, Bulgaria, assignors to Vish-Mahinnoelektritechnicheski Institute, Varna, Bulgaria

Filed Apr. 20, 1982, Ser. No. 370,083
Int. Cl.³ B02C *19/12*
U.S. Cl. 241—29 **5 Claims**



1. A method for finely granulating sticky and/or agglomerated material by means of controlled vortices, comprising the steps of

feeding a sticky and/or agglomerated material centrally of a first inlet milling chamber of an arrangement comprising a cylindrical stator and a rotor axially rotatably disposed therein which divides the stator into first and second milling chambers;

crumbling said material in said first milling chamber to a particle size of about 0.4 mm;

transporting the so crumbled material by means of a main vortex produced by the coaction of the rotating rotor and stator to a plurality of microvortices simultaneously produced at the periphery of the rotating rotor by said coaction to thereby finely granulize the crumbled material; said granulation being effected at the interfaces between the main vortex and the plurality of peripheral vortices; and

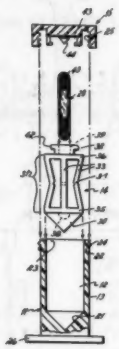
thereafter transporting said finely granulated material to the second milling chamber for further granulization.

4,505,433

TISSUE GRINDING AND TRANSPORTING DEVICE

William M. Selenke, 18 Gambier Cir., Cincinnati, Ohio 45218

Filed Sep. 28, 1982, Ser. No. 425,509
Int. Cl.³ B02C *23/36*
U.S. Cl. 241—46 R **19 Claims**



1. A device for grinding solids, such as surgical tissue samples, comprising:

a container, the container having an interior defined within sidewalls, an upper portion having an upwardly open top, and an interior bottom;

a grinder receivable in the interior of the container, the grinder comprising,

a grinding head

a body portion having an interior space defined therein,

a cap receivable in the upper portion of the container; and

a closed fluid reservoir located within the interior space of the body portion;

at least one port in the grinder through which fluid can pass into the container;

the grinder and container having a grinding configuration wherein the grinding head is located adjacent the bottom interior of the container and the cap is applied to the container upper portion placing the grinder under compression, release of fluid from the closed reservoir being effected through application of the cap to the container upper portion to thereby rupture the fluid reservoir releasing the fluid, grinding being effected through rotation of the cap, the cap further serving to close the container.

4,505,434

FORAGE HARVESTER RECUTTER SCREEN

Wayne B. Martenas, New Holland, and Edward H. Priepke, Lancaster, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Aug. 31, 1983, Ser. No. 528,014
Int. Cl.³ B02C *18/22*
U.S. Cl. 241—89.3 **5 Claims**

1. In a forage harvester having a mobile main frame,

a cutterhead housing mounted on the frame and having a crop inlet area;

means for feeding crop material to said inlet area of said cutterhead housing,

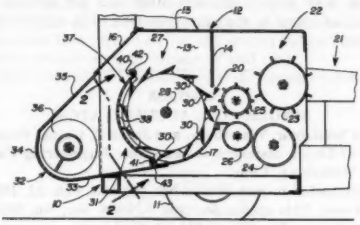
a generally cylindrical cutterhead mounted for rotation in said housing, said cutterhead having a plurality of knives with parallel cutting edges which generate a cylinder along their path at the cutterhead periphery under conditions where the cutterhead rotates said knives into engagement with crop being fed through the inlet area by said crop feeding means,

said knives cutting and said cutterhead impelling crop material along the peripheral path of the knives,

crop collection means for collecting and conveying away

crop material that has been cut and impelled by said cutterhead, and

a generally arcuate shaped recutter screen having a plurality of apertures for cooperating with said knives to recut said cut crop material, said screen mounted closely adjacent the peripheral path of the knives, generally coaxial therewith and between the rear portion of the path of said knives and said collection means, the improvement comprising:



said arcuate recutter screen aperatures being provided in a first series having a first size and a second series having a second size, said second size being greater than said first size and further along said peripheral path of the knives whereby the crop material which is not reduced sufficiently in size by cooperation between said first series of said apertures and said knives to pass through said first of said apertures is recut by cooperation between the knives and subsequent larger apertures in said second series and permitted to pass through such subsequent larger apertures.

4,505,435

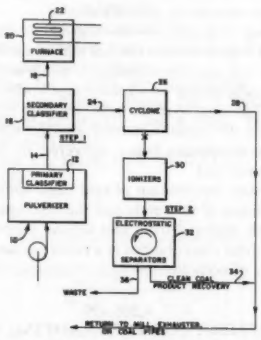
APPARATUS FOR REMOVAL OF TROUBLESOME MINERAL MATTER FROM PULVERIZED COAL

Todd D. Hellewell, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 16, 1983, Ser. No. 495,012

Int. Cl.³ B02C *23/32*

U.S. Cl. 241—79.1 **2 Claims**



1. In combination a pulverizing mill in which coal is pulverized, a pulverizer outlet through which the pulverized coal is discharged in an air stream, first classifier means connected to the pulverizer outlet for separating some of the heavy large particles out of the air stream, means by which the heavy particles are returned to the pulverizing mill for further pulverizing, second classifier means connected to the first classifier means in which more of the heavy large particles are separated out of the air stream, the second classifier means including a curved duct for imparting centrifugal force to the coal-air stream so that most of the solid particles are thrown outwardly against the outer wall, and a blade extending through an outer wall at an angle to thereby skim off some of the large heavy particles from the air stream, said blade being adjustable so that the distance it extends through the outer wall can be varied, thus varying the amount of heavy large particles separated from the air stream, a furnace, means connecting the second classifier means to the furnace, so that the air stream along with the remaining coal particles can be transferred therein to the furnace, where the coal is combusted, separating means capable of separating organic particles from inorganic particles, and means through which the heavy large particles separated from the air stream in the second classifier means are transferred to the separating means.

4,505,436

YARN WINDING APPARATUS

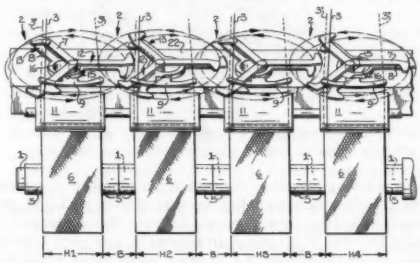
Heinz Schippers; Erich Lenk; Herbert Turk, all of Remscheid, and Herbert Schiminski, Hückeswagen, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Dec. 29, 1983, Ser. No. 566,583

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301523; Jan. 28, 1983, 3302805; Mar. 5, 1983, 3307915; Mar. 21, 1983, 3310161

Int. Cl.³ B65H *54/28*

U.S. Cl. 242—43 A **39 Claims**



1. A winding apparatus for winding a plurality of running yarns to form a corresponding number of yarn packages, and comprising bobbin support means for mounting a plurality of tubular bobbins in a coaxial arrangement, and yarn traverse means for reciprocating the running yarns along respective aligned traverse strokes and so as to form a wound yarn package on each bobbin, the improvement wherein said yarn traverse means comprises a plurality of traversing assemblies disposed in a closely spaced apart arrangement extending along said bobbin support means so as to permit the bobbins to be disposed closely adjacent to each other on said support means, with each traversing assembly being adapted to reciprocate a running yarn onto a rotating bobbin mounted on said support means, and with each traversing assembly comprising

(a) a yarn guide bar mounted to extend in a direction generally parallel to the axis of said bobbin support means,

(b) a first rotor having at least two coplanar radial arms and mounted for rotation about a first axis such that the extremities of the rotating arms pass along said yarn guide and define a first plane,

(c) a second rotor having at least two coplanar radial arms and mounted for rotation about a second axis such that the extremities of the rotating arms pass along said yarn guide and define a second plane, and with said first axis being parallel to and offset from said second axis in a direction generally parallel to the axis of said bobbin support means, and with the first and second planes being parallel to and closely adjacent each other,

said traversing assemblies being mounted adjacent to each other such that each traversing assembly has its first axis offset from its second axis in a direction which is opposite

to the direction of offset in each immediately adjacent traversing assembly, and such that said first and second planes of said assemblies are respectively coincident, and further such that the extremities of the rotor arms of adjacent traversing assemblies define circles upon rotation thereof which overlap in at least one of said first and second planes, and

drive means for rotating the rotors of each traversing assembly in opposite directions with respect to each other, and for rotating the rotors of adjacent traversing assemblies such that the first rotors thereof rotate in opposite directions with respect to each other and the second rotors thereof rotate in opposite directions with respect to each other.

4,505,437

APPARATUS FOR WINDING A PLURALITY OF YARNS

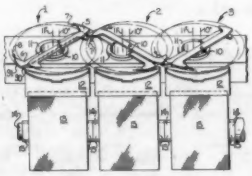
Heinz Schippers; Erich Lenk; Herbert Turk, and Herbert Schminski, all of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,508

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1983, 3302962; Mar. 24, 1983, 3310620; Aug. 11, 1983, 3328968

Int. Cl.³ B65H *54/28*

U.S. Cl. 242—43 A **22 Claims**



1. A winding apparatus for winding a plurality of running yarns to form a corresponding number of yarn packages, and comprising bobbin support means for mounting a plurality of tubular bobbins in a coaxial arrangement, and yarn traverse means for reciprocating the running yarns along respective aligned traverse strokes and so as to form a wound yarn package on each bobbin, the improvement wherein said yarn traverse means comprises a plurality of traversing assemblies disposed in a closely spaced apart arrangement extending along said bobbin support means so as to permit the bobbins to be disposed closely adjacent to each other on said support means, with each traversing assembly being adapted to reciprocate a running yarn onto a rotating bobbin mounted on said support means, and with each traversing assembly comprising

(a) a yarn guide bar mounted to extend in a direction generally parallel to the axis of said support means,

(b) a first rotor having two oppositely directed radial arms of equal length, and with said rotor being mounted for rotation about a first axis such that the extremities of the rotating arms pass along said yarn guide bar and define a first plane,

(c) a second rotor having two oppositely directed radial arms of equal length and which generally correspond to the length of said arms of said first rotor, and with said second rotor being mounted for rotation about a second axis such that the extremities of the rotating arms pass along said yarn guide bar and define a second plane, and with said first axis being parallel to and offset from said second axis in a direction generally parallel to the axis of said support means, and with the first and second planes being parallel to and closely adjacent each other,

said traversing assemblies being mounted adjacent to each other such that each traversing assembly has its first axis offset from its second axis in the same direction and with the corresponding axes of all of the adjacent traversing assemblies being equally spaced apart a distance which is less than twice the radial length of the arms and greater than the radial length of the arms times the square root of two, and such that said first and second planes of said assemblies are respectively coincident, and further such that the extremities of the arms of adjacent traversing assemblies define circles upon rotation thereof which overlap in both of said first and second planes, and

drive means for rotating the rotors of each traversing assembly in opposite directions with respect to each other, and for rotating the rotors of adjacent traversing assemblies such that the first rotors thereof rotate in the same direction with respect to each other and the second rotors thereof rotate in the same direction with respect to each other.

4,505,438

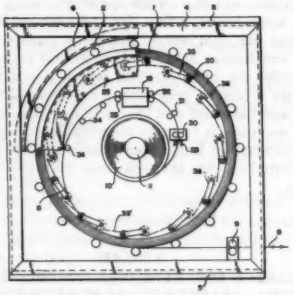
SINGLE COIL ACCUMULATOR

Tadeusz Sendzimir, Waterbury, and Jacek Z. Gajda, Woodbury, both of Conn., assignors to Sendzimir Engineering Corporation, Waterbury, Conn.

Continuation-in-part of Ser. No. 468,688, Feb. 22, 1983, abandoned. This application Apr. 9, 1984, Ser. No. 598,200

Int. Cl.³ B65H *17/42, 17/48*

U.S. Cl. 242—55 **21 Claims**



1. The method of intermittently replenishing a high-capacity single accumulator coil of strip material, wherein the strip is fed from a supply coil into the innermost convolution of the accumulator coil and is withdrawn from the outermost convolution thereof to provide a continuous supply of the strip to downstream equipment, which includes

(a) the step of joining the leading end of strip material in a second supply coil to the tail end of said first-mentioned supply coil upon its exhaustion, while said ends are fixed in a joining device on a rotary cage within said accumulator coil adapted to rotate with the latter to offer no impediment to the rotation thereof and the withdrawal of the outer convolutions being delivered to the downstream equipment, and

(b) reversing the rotation of said cage upon completion of said joining of said ends and the resumption of travel of said strip material from said second supply coil, to build up the inner convolutions at a rapid rate and to the desired number of convolutions of said accumulator coil.

4,505,439

ARRANGEMENT FOR THE CLAMPING OF A WARP BEAM TUBE OR THE LIKE

Gottfried Scholze; Dietrich Scholze, and Johannes Maier, all of Frankenberg, Fed. Rep. of Germany, assignors to Erich Scholze GmbH & Co. KG, Fed. Rep. of Germany

Filed Dec. 29, 1982, Ser. No. 454,272

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1982, 3236798

Int. Cl.³ F16D *1/06;* F16B *2/06, 7/04*

U.S. Cl. 242—68.4 **3 Claims**

1. Arrangement for clamping a warp beam tube and the like to a square rod, said arrangement comprising:

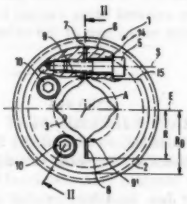
a flange fixed to an axial end of the beam tube, said flange being constructed as a one piece clamping ring;

said clamping ring including a square axial opening for reception of the square rod to provide for a central clamping-in of the square rod;

a first slit extending through said clamping ring from one corner of said square opening to an outer circumferential surface of said clamping ring, said first slit having a selected width;

a second partial slit being diametrically opposite said first slit and extending through said clamping ring from an opposite corner of said square opening in an opposite direction than said first slit and ending at a spaced distance from said outer circumferential surface of said ring;

said first slit and said second partial slit running substantially



radially to said clamping ring to facilitate said central clamping-in of the square rod;

said first slit, said square opening and said second partial slit communicating with each other to divide said clamping ring into a first section and a second section;

securing means for only fixing said first section to the axial end of the beam tube so that said second section can pivotally move relative to said first section; and

said first slit being bridged by at least one clamping screw so that said selected width of said first slit is reducible by a tightening of said clamping screw;

whereby said second section pivotally moves toward said first section when said clamping screw is tightened to provide for said central clamping-in of the square rod within said square axial opening.

4,505,440

TAPE CASSETTE

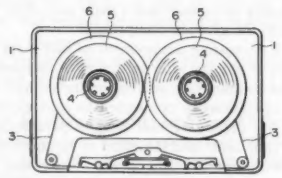
Takao Kawashima, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 2, 1982, Ser. No. 394,960

Claims priority, application Japan, Jul. 3, 1981, 56-99705[U]; Jul. 8, 1981, 56-102282[U]; Jul. 8, 1981, 56-102283[U]; Jul. 20, 1981, 56-107412[U]

Int. Cl.[3] **G03B** *1/04;* **G11B** *15/32*

U.S. Cl. 242—199 **15 Claims**



8. A reel-to-reel tape cassette comprising:

a pair of hubs for carrying a tape, each of said hubs having at least one flange with the flanges being on the same side of said tape, said hubs being disposed laterally in side-by-side relation, said cassette further comprising at least one generally rectangular sheet, said sheet having a plurality of protrusions and adapted to fold over upon itself to form a rectangular structure having end portions extending beyond peripherally outer edges of and enclosing said flanges.

4,505,441

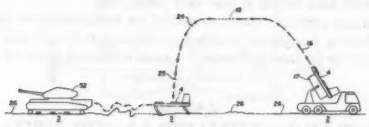
TERRAIN-FOLLOWING TRANSIENT SURFACE CONTACT VEHICLE

Jerome Kirsch, Dix Hills; M. Alan Kopsco, Wantagh; Edward Markow, Oakdale, and Michael Sturm, Flushing, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 20, 1983, Ser. No. 505,809

Int. Cl.[3] **F41G** *9/00*

U.S. Cl. 244—3.15 **27 Claims**



1. A terrain-following transient surface contact vehicle for transporting a load from a surface starting point to a surface end point, said vehicle comprising

a structure for carrying said load from said starting point to said end point;

vehicle support means extending from said structure and abutting said surface and thereby supporting said vehicle at a predetermined distance above said surface;

acquisition sensing means mounted on said structure for initiating surface operations;

sensing means mounted on said structure and cooperating with said acquisition sensing means to sense and track a target at said end point upon initiation of surface operations;

power means mounted on said structure and cooperating with said sensing means to energize upon tracking of said target and to move said vehicle along said surface at said predetermined distance above said surface to impact with said target at said end point; and

position control means mounted on said structure for producing a negative pitching moment to maintain said structure in terrain-following contact with said surface.

4,505,442

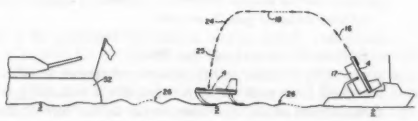
TRANSIENT SURFACE CONTACT VEHICLE

Jerome Kirsch, Dix Hills; M. Alan Kopsco, Wantagh; Edward Markow, Oakdale, and Michael Sturm, Flushing, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 20, 1983, Ser. No. 505,815

Int. Cl.[3] **F41G** *9/00;* **F42B** *15/20*

U.S. Cl. 244—3.15 **20 Claims**



1. A transient surface contact vehicle for transporting a load from a surface starting point to a surface end point, said vehicle comprising

a structure for carrying said load from said starting point to said end point;

vehicle support means extending from said structure;

buoyancy control means mounted on said structure and

coupled to said vehicle support means for selectively making said support means buoyant and non-buoyant whereby when said support means are buoyant said support means abut the surface of a body of water thereby supporting said vehicle at a predetermined distance above said surface of said body of water;

acquisition sensing means mounted on said structure for initiating water surface operations;

sensing means mounted on said structure and cooperating with said acquisition sensing means to sense and track a target in said water at said end point upon initiation of water surface operations;

power means mounted on said structure and cooperating with said sensing means to energize upon tracking of said target and to move said vehicle along said water surface at said predetermined distance above said surface to impact with said target at said end point; and

position control means mounted on said structure for producing a negative pitching moment to maintain said structure in surface-following contact with said body of water.

4,505,443

PROPULSION SYSTEM FOR A V/STOL AIRPLANE

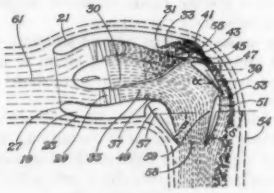
Ganey W. Bradfield, Fort Worth, and Glynn P. Cragin, Jr., Irving, both of Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Division of Ser. No. 974,589, Dec. 29, 1978, Pat. No. 4,301,980. This application Aug. 27, 1981, Ser. No. 296,710

The portion of the term of this patent subsequent to Nov. 24, 1998, has been disclaimed.

Int. Cl.³ B64C *29/00, 15/02*

U.S. Cl. 244—12.5 **14 Claims**



1. In a vertical and/or short takeoff and landing (V/STOL) airplane, a propulsion system providing enhanced thrust and airplane handling qualities through more efficient turning of its exhaust between horizontal and upward directed flight modes which comprises:

propulsion means for generating a higher than ambient static pressure flow of thrust producing exhaust gas, said propulsion means being a high by-pass ratio turbofan engine having an engine core exhaust;

exhaust nozzle means for directing at least a portion of said exhaust gas flow from the propulsion means to the airplane exterior, and to turn the flow between substantially horizontal and downwardly directed flow positions;

said exhaust nozzle means comprising:

primary thrust nozzle means for the exit of a major portion of said exhaust gas flow, and

secondary thrust nozzle means for bleeding off a minor portion of the exhaust gas flow;

said secondary thrust nozzle means positioned to effect the bleed-off from said major portion of the exhaust gas flow downstream of the commencement of the turn therein so as substantially to prevent formation of dynamic pressure-induced contra-rotating vortices in the outside of the turn thereby substantially preventing thrust reducing contra-rotating vortex formation in the gas flow therein; and

said secondary thrust nozzle means being directionally movable so as to direct the bleed-off to flow closely parallel to the major portion of the exhaust flow at all positions thereof whereby the bleed-off is turned together with the major portion of the exhaust flow, effectively to provide a coherent unitary-like exhaust stream passing from said airplane at all angles of flow from horizontal to downward flow;

thereby maximizing both the thrust from said major portion of the flow and the recovery of thrust from said bleed-off flow and improving the handling qualities of the airplane at all positions of turning of the exhaust gas flow

at least one of said primary thrust nozzle means and said secondary thrust nozzle means being in the form of elongated slot means that are formed by a tandemly arranged series of movable flap means providing lifting surfaces for said airplane and in which said bleed-off exhaust flow is directable over at least some of said lifting surfaces substantially tangent thereto to retard boundary layer separation during horizontal and transitional flight positions and to enhance the turning of said bleed-off flow together with said major portion of the exhaust gas flow;

the engine core exhaust being caused to exit from said airplane upstream of the exit of the exhaust from the engine fan.

4,505,444

AIRCRAFT EJECTION SEAT SYSTEM

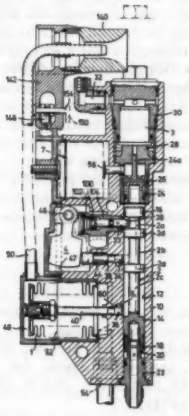
John S. Martin, Denham, Nr. Uxbridge, England, assignor to Engineering Patents & Equipment Limited, St. Peter, Channel Islands

Filed Jan. 18, 1983, Ser. No. 458,777

Claims priority, application United Kingdom, Feb. 9, 1982, 8203711

Int. Cl.³ B64D *25/10, 17/74*

U.S. Cl. 244—122 AE **7 Claims**



1. An aircraft ejection seat system having an ejection seat for accommodating an airman and a main parachute for lowering the airman to the ground, comprising:

means for permitting deployment of said main parachute at the end of a delay after initiation of ejection of the seat/airman combination, said means including a drogue parachute operationally connected to said ejection seat and means for deploying said drogue parachute a predetermined time after said initiation of ejection; and

mode selector mechanism means for sensing at least one predetermined condition and for permitting deployment of said main parachute at a time prior to expiration of said delay provided that a predetermined condition is sensed, said mode selector mechanism means including means for sensing deceleration of the seat/airman combination by the drogue parachute and means for inhibiting operation of said mode selector mechanism means resulting in de-

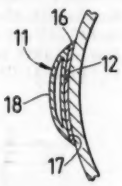
ployment of said main parachute after said time prior to expiration of said delay if said deceleration exceeds a predetermined value, wherein said means for inhibiting operation of said mode selector mechanism means includes an abutment member, said means for sensing being operable to move said abutment member from a withdrawn position to an inhibiting position when said deceleration exceeds said predetermined value, a locking member movable between a retracted and a locking position, and spring means for urging the locking member towards its locking position, said locking member in its locking position holding said abutment member in its inhibiting position so that said abutment member, if moved to said inhibiting position after release of the locking member, is held permanently in said inhibiting position.

4,505,445

APPARATUS FOR DE-ICING THE LEADING EDGE OF AN AIRFOIL SECTION OF AN AIRCRAFT

Robert A. Allison, Hueytown, Ala., assignor to Idea Development Corporation, Birmingham, Ala.

Filed Feb. 15, 1983, Ser. No. 466,372
Int. Cl.³ B64D *15/02*
U.S. Cl. 244—134 B **1 Claim**



1. Apparatus for de-icing the leading edge of an airfoil section of an aircraft propelled by at least one power unit having an oil circulating system associated therewith with the oil circulated by said system being heated to an elevated temperature by the operation of said power unit comprising:

(a) a closed circuit conduit system having a heat conductive section which extends along the leading edge of said airfoil section and is generally flat as viewed in cross section with the contour of the rear side thereof corresponding generally to that of said leading edge of said airfoil section,

(b) means communicating one end of said heat conductive section with the discharge side of said oil circulating system so that heated oil is circulated through said heat conductive section,

(c) means communicating the other end of said heat conductive section with the suction side of said oil circulating system,

(d) auxiliary pumping means in said closed circuit conduit system adjacent said other end of said heat conductive section to aid in circulating said heated oil through said closed circuit conduit system, and

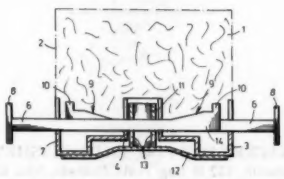
(e) means securing the rear side of said heat conductive section to and insulating it from said leading edge of said airfoil section with the leading side of said heat conductive section defining an exposed heated surface to reduce the formation of ice on said leading edge of said airfoil section and to cool said oil returned to said suction side of said oil circulating system.

4,505,446

MEANS FOR REMOVABLY SECURING A DECORATIVE ITEM TO A NONPOROUS SURFACE

Manfred Röder, Frankenthal, Fed. Rep. of Germany, assignor to Smithers-Oasis Company, Kent, Ohio

Filed Jun. 8, 1983, Ser. No. 502,137
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3221714
Int. Cl.³ F16B *47/00*
U.S. Cl. 248—205.8 **1 Claim**



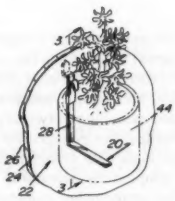
1. In combination with a container having a housing and intended to support a decorative item, means demountable to secure the container to a smooth surface, said securing means comprising: a suction cup attached to said housing; a pin secured to a central portion of said suction cup; a guide presented from said housing; said pin being axially translatable within said guide; said pin being provided with a transverse slot; a pair of thrust bars; an oblique camming surface presented from each said thrust bar; said camming surfaces being oriented in opposition, one to the other; said thrust bars being translatable within said transverse slot radially of said pin; said camming surfaces engaging said transverse slot such that radial translation of said thrust bars effects the application of equal and opposite forces against said pin axially to translate said pin and thereby actuate said suction cup.

4,505,447

WALL SUPPORT

Louis R. Shaheen, 534 W. Moreland Ave., Horsham, Pa. 19044

Continuation of Ser. No. 201,665, Oct. 27, 1980, abandoned.
This application Jan. 10, 1983, Ser. No. 457,100
Int. Cl.³ A47B *96/06*
U.S. Cl. 248—216.1 **9 Claims**



1. A support for mounting an object on a vertically disposed wall portion having an exterior surface and an interior surface spaced from each other by a predetermined distance, said support comprising body means, leg means and internal support means, said body means being an elongated planar member having a first and second end, said leg means and said internal support means each including opposing first and second planar surfaces, wherein said leg means is approximately equal in length to said predetermined distance and being connected to the first end of said body means perpendicularly to the plane thereof, said internal support means comprising sharp pointed piercing means which is connected to said leg portion parallel to the plane of said body means and arranged to pierce extended through an opening in said wall portion connecting

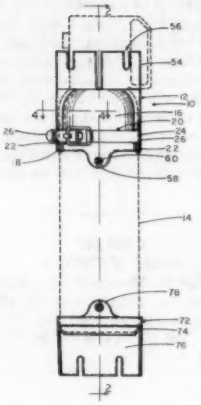
said surfaces, whereupon, when said support is rotated downward with respect to said wall portion a first planar surface of said internal support means abuts said interior surface of said wall portion, with said body portion abutting said exterior surface and said second planar surface of said leg portion disposed horizontally and resting on the wall portion contiguous with said opening.

4,505,448

BRACKET FOR FIRE EXTINGUISHERS

Claude P. Massie, 122 B Log Trail, Ballwin, Mo. 63011

Filed Aug. 19, 1983, Ser. No. 524,857
Int. Cl.³ A62C *39/00*
U.S. Cl. 248—313 **3 Claims**



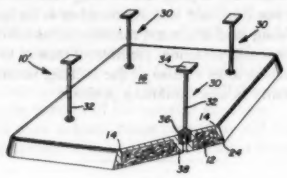
1. A bracket for fire extinguishers comprising a base member including a face adapted to engage a fire extinguisher, mounting means associated therewith for mounting said base member to a support surface, and strap members connected thereto adjacent said face and extending outwardly therefrom adapted to fit about a fire extinguisher engaged by said face, said strap members having free ends with complementary latch portions connected thereto adapted for releasably latching said strap members about a fire extinguisher engaged by said face, said strap members being movable between a closed position wherein said latch mechanism is adapted to latch said straps to engage a fire extinguisher and press it into tight-fitting engagement with said face and an open position wherein a fire extinguisher can be moved laterally from said bracket without encountering said mounting means, one of said strap members having a fire extinguisher engaging surface with a substantially semi-spherical protuberance extending inward from a position near the free end thereof, said protuberance adapted to hold an adjacent portion of said fire extinguisher-engaging surface of said strap member out of abutting alignment with a fire extinguisher and establishing a fulcrum such that said complementary latch portions snap into a latched position below said fulcrum and automatically spring apart once said latch portions are brought to a position above said fulcrum.

4,505,449

LIGHTWEIGHT CONCRETE CLADDED HEAVY EQUIPMENT BASE

George S. Turner, Conyers, and Donald B. Mitchell, Lilburn, both of Ga., assignors to Diversitech Corporation, Conyers, Ga.

Filed Feb. 22, 1980, Ser. No. 123,779
Int. Cl.³ F16M *3/00*
U.S. Cl. 248—669 **7 Claims**



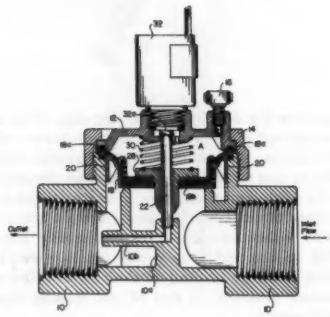
1. A base for the support of equipment, said base comprising: a foam core having a top, a bottom and a plurality of side surfaces; and a coating attached to at least said top and all of said side surfaces of said foam core, said coating comprising a cementitious material, said cementitious material covering the top and sides only of said foam core.

4,505,450

SOLENOID-OPERATED PILOT-ACTUATED VALVE

Myrl J. Saarem, and Donald E. Lovelace, both of Carson City, Nev., assignors to Richdel, Inc., Carson City, Nev.

Continuation of Ser. No. 815,252, Jul. 13, 1977, abandoned. This application Mar. 20, 1981, Ser. No. 245,969
Int. Cl.³ F16K *31/02, 31/126*
U.S. Cl. 251—24 **2 Claims**



1. A solenoid-operated valve including: a body portion defining a lower chamber with an internal seat and an inlet extending into said lower chamber, said body portion further defining an outlet; a cap portion; a diaphragm assembly mounted in the valve in a position to be biased against the seat and against the flow of fluids through the valve so as to control the flow of fluids through the valve from the lower chamber to the outlet, said diaphragm assembly defining a closed upper chamber in the valve with said cap portion; said diaphragm assembly having an integral peripheral seal interposed between said cap portion and said body portion; an open-ended nut threaded to said body portion coaxial with said cap portion to clamp said cap portion to said body portion; a bushing-like guide member mounted in said diaphragm assembly and defining an aperture extending therethrough; a support bracket in said lower chamber integral with said body portion; a stationary open-ended bleed tube mounted on said support bracket and extending through the aperture in the diaphragm assembly

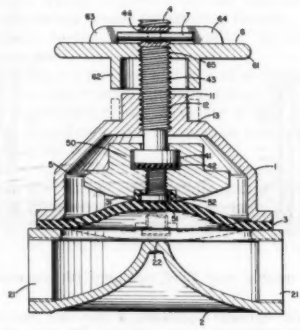
from the lower chamber into the upper chamber, said bushing-like guide member forming an annular passage with the outer surface of said bleed tube for restricted flow of fluid from the lower chamber into the upper chamber at a rate less than the rate of flow of fluid through said bleed tube when the bleed tube is open; a solenoid mounted on the cap portion of said valve and having a plunger positioned normally to close the upper end of the bleed tube; and exit port means including an elongated tubular member mounted on said support bracket coaxially with said outlet and coupled to the lower end of the bleed tube through a passageway in said support bracket to provide a flow path from the upper chamber through the bleed tube and through the passageway in said bracket and through said elongated tubular member to said outlet when the plunger is retracted from the upper end of the bleed tube.

4,505,451

DIAPHRAGM VALVE

Rolf Jonas, Kiriat Bialik, Israel, assignor to Kim Production Limited, Haifa Bay, Israel

Filed May 27, 1982, Ser. No. 382,727
Claims priority, application Israel, Jul. 15, 1981, 63319
Int. Cl.³ F16K *7/16*
U.S. Cl. 251—285 **5 Claims**



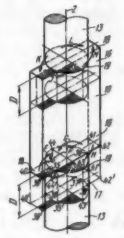
1. In a diaphragm valve having a casing, and a reciprocating threaded spindle in said casing, a device for protecting the diaphragm against excessive mechanical pressure in the fully closed position of the valve, said device comprising means for adjustably connecting a handwheel to said spindle at a predetermined distance from said casing and means for limiting the movement of said handwheel in the direction of said casing, said handwheel having an internally threaded bore for engagement with said threaded spindle in such a manner as to be threadedly adjustable along said spindle, said limiting means comprising a collar integral with said handwheel and a planar surface on said casing, said spindle including at its upper end a transverse opening, and said handwheel including at least one transverse groove in the upper surface thereof traversing said threaded bore and being of a width not less than the diameter of said transverse opening, and pin means removably inserted into said transverse opening and in engagement with said transverse groove, whereby said pin means prevents relative rotation of said handwheel and said spindle when said pin means is in place, whereby when said valve is closed, said collar contacts said planar surface, thereby limiting further closing movement of said handwheel.

4,505,452

GATE VALVE

Boris F. Bragin, Kvartal 50 let Oktyabrya, 52, kv. 60; Jury B. Korotkikh, ulitsa Lenina, 103, kv. 53; Felix D. Markuntovich, 10 mikroraion, 5, kv. 39, all of Voroshilovgrad, and Evgeny P. Olofinsky, prospekt Mira, 194, kv. 58, Moscow, all of U.S.S.R.

Filed Jan. 13, 1984, Ser. No. 570,370
Int. Cl.³ F16K *3/314, 3/00*
U.S. Cl. 251—326 **2 Claims**



1. A gate valve for a pipeline, comprising: a housing; butt pipes of said housing for being connected to said pipeline for forming a straight-flow passage therewith; a gate arranged inside said housing and having a hole for the passage therethrough of a fluid being conveyed in the form of a suspension of solid particles and a surface engageable with at least one of said butt pipes for shutting-off the butt pipe; a drive for imparting reciprocations to said gate for opening and shutting-off the straight-flow passage; rods of said drive arranged coaxially on either side of the centerline of said butt pipes and accommodated inside said housing for a part of their length; ends of said rods adjacent to said gate; the ends of said gate remote from the axis of said butt pipes being connected to said ends of said rods; said gate and each of said rods having equal areas in cross-sections perpendicular to the axis of said rods; said gate having at said ends thereof, and each of said rods having at said ends thereof, shaped end faces facing toward each other which are designed for the passage of solid particles of a fluid being conveyed during the reciprocations of said gate from a space partially occupied by said gate to a space being left by one of said rods adjacent thereto, and also from a space occupied by the other of said rods to a space being left by the part of said gate adjacent thereto.

4,505,453

GATE VALVE

Pierre L. Barbe, Toul, and Jean P. Depoisson, Pont-A-Mousson, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Sep. 23, 1981, Ser. No. 304,769
Claims priority, application France, Oct. 13, 1980, 80 21808
Int. Cl.³ F16K *3/314, 3/316*
U.S. Cl. 251—328 **9 Claims**

1. A gate valve comprising in combination:

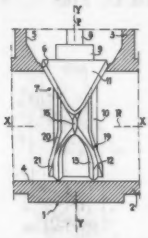
a body (1) which has a flow passageway (2) having a tubular flow cavity (4) and a horizontal flow axis, and a housing which has a vertical axis and radially opens into said passageway, said flow passageway comprising a seat surface in two parts which are symmetrical relative to two perpendicular planes which contain the axis of the housing, one of which planes contains the flow axis,

a closure member (7) provided with a sealing bead (13), having a perimeter, and guided in vertical translation in the housing and in the flow passageway,

the closure member comprising, on at least one side within the perimeter of the sealing bead, a guiding bearing surface (19-20) for guiding the vertical movement of the closure member and which has vertical generatrices and

the general shape of an upwardly open U which extends from the lower end thereof to a region located above the equatorial plane thereof and which is in projecting relation, at each level, to the sealing bead,

the body comprising, between the flow passageway and the seat surface on the corresponding side of the body, a complementary guiding bearing surface (16-17-18) which



is located on said flow cavity (4) for cooperation with said guiding bearing surface (19-20) of the closure member for guiding its vertical sliding movements during the opening and closure operations of the gate valve, and which has vertical generatrices and extends from the upper part of the seat surface to a region located below said equatorial plane and which has, when viewed along the flow axis, the shape of a downwardly open C.

4,505,454

CHECK VALVE

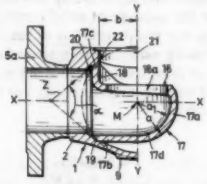
Walter Siepmann, Warstein, Fed. Rep. of Germany, assignor to Siepmann-Werke GmbH & Co. KG, Warstein, Fed. Rep. of Germany

Filed Nov. 28, 1983, Ser. No. 555,691

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3244020

Int. Cl.³ B23P *15/00*

U.S. Cl. 251—367 **18 Claims**



1. In a check valve for nominal widths over 50 mm having a composite intermediate housing part with a throughflow axis and short supply and discharge connecting pipes lying on said throughflow axis, a cover flange defining a housing opening and arranged on said intermediate housing part concentrically to a valve spindle axis which is normal to said throughflow axis for mounting a valve cover, and an angular pipe bend located at said intermediate housing part and carrying a seat ring extending above and parallel to said throughflow axis and having a spherical deflecting portion and a cylindrical portion connected with said spherical portion and concentrically surrounding said throughflow axis, wherein the longitudinal portion has a bottom for mounting said bend in a transition region between said supply connecting pipe and the interior of said intermediate housing part and having an opening for passage of a medium, the improvement in that said intermediate housing part is assembled from two identical, substantially semispherical one-piece shell halves having a separation plane and beam welded in said separation plane, said cover flange being ring-shaped and including two half rings which together with said connecting pipes are parts of said shell halves so that the separation plane in which said shell halves are welded coincides with a vertical plane lying in the spindle axie and intersecting said throughflow axis, wherein the point of intersection said plane with said throughflow axis forms a center of said spherical intermediate housing parts, said intermediate housing part has a conical bore, said pipe bend has an end portion which surrounds said bottom and is provided at its outer periphery with a truncated-cone-shaped chamfer with which it is axially inserted in said conical bore and welded through said supply connecting pipe from outside with the aid of an electron beam extending conically under a respective cone angle α, and said pipe bend is arranged and formed such that its spherical deflection portion has a center which is at least close to said center of said spherical intermediate housing part.

4,505,455

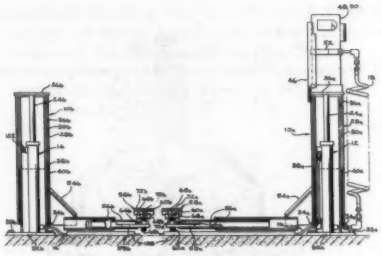
SYNCHRONIZED DOUBLE POST FLUID OPERATED LIFT ASSEMBLY

Harry F. Beatty, Clarksville, Ind., assignor to VBM Corporation, Louisville, Ky.

Filed Jun. 21, 1982, Ser. No. 390,209

Int. Cl.³ B66F *7/12*

U.S. Cl. 254—89 H **18 Claims**



11. In a double post fluid operated lift assembly, a post comprising

a hydraulic cylinder including a movable piston member disposed therein,

a stationary hollow tube disposed around said cylinder,

a movable hollow tube disposed around said stationary tube, said tubes being spaced apart laterally to provide a gap therebetween, said movable tube being connected to said piston member for translational movement therewith,

a hollow sleeve disposed within and around said gap and being fixedly connected to said movable tube for movement therewith, said sleeve being spaced from said stationary tube,

spacer means constructed of relatively non-abrasive material connected to upper and lower end portions of said sleeve and projecting inwardly of said sleeve for slidable contact against said stationary tube,

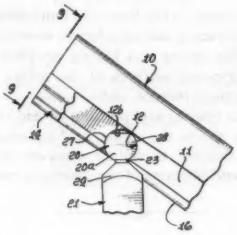
a carriage arm connected to said movable tube opposite said sleeve for translational movement with said movable tube, said arm being swingable through a horizontal circular arc, said sleeve and spacer means restraining said movable tube from tilting relative to said stationary tube, and

an article supporting pad connected to said carriage arm, said pad being freely rotatable about a vertical axis and freely rockable through a vertical arc between stops, whereby said post can lift and lower a cantilevered load partially supported by said arm and pad.

4,505,456
RAILING AND BALUSTER CONNECTION

Steven A. Zieg, Anaheim Hills, Calif., assignor to Mansion Industries, Inc., City of Industry, Calif.

Filed Mar. 12, 1984, Ser. No. 588,247
Int. Cl.[3] E04H 17/14
U.S. Cl. 256—67 12 Claims



1. For combination with a rail having an elongated recess sunk in one lateral side thereof and also having at least one interior socket laterally intersecting said recess, the socket having an interior laterally facing wall defined by the rail, the socket also having a generally cylindrically curved interior wall, and an elongated moulding received in said recess and attached to the rail to laterally block said recess, the improvement comprising

(a) a baluster having a pivot at an end thereof, the pivot receivable in said socket for pivoting therein,

(b) the pivot having generally parallel, laterally spaced opposite sides,

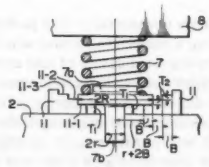
(c) the pivot having first and second wall sections which are spaced apart and extend generally cylindrically in matching curved relation to the curvature of said socket wall, portions of said sections remaining in the socket during pivoting of the baluster,

(d) the pivot also having a third wall section which intersects said first and second wall sections and which is spaced inwardly from a cylindrical locus forming a continuation of said first and second wall sections, whereby said third wall section remains in said socket during baluster pivoting

4,505,457
RAILWAY TRUCK SPRING HEIGHT ADJUSTMENT DEVICE

Yukio Okada, Amagasaki, and Akira Iwamura, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jun. 2, 1982, Ser. No. 384,675
Claims priority, application Japan, Jun. 5, 1981, 56-83543[U]
Int. Cl.[3] B61F 5/50; F16F 1/26; F16M 7/00
U.S. Cl. 267—3 6 Claims

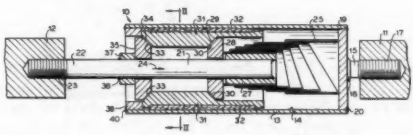


1. A height adjusting device for a truck of a railroad vehicle having a chassis comprising a spring adapted to support the chassis of said vehicle on a base member, a spring retainer provided with a center pin and at least one spring retainer supporting member movable toward and away from the axis of said spring retainer and having a plurality of concentric segments arranged and fixed around said spring and spring retainer in symmetry with respect to the axis of said spring and spring retainer at a constant circumferential pitch, each of said concentric segments having an upper surface which is stepped in such a manner that the height thereof is successively increased in a stepped manner as the distance of said upper surface from the spring axis increases, thereby providing a plurality of horizontal spring retainer supporting surfaces, said device further comprising adjustable securing means adapted to locate and fix each of said concentric segments of said spring retainer supporting member at a predetermined position relative to the axis of said spring.

4,505,458
LINEAR FRICTION DAMPED MECHANISM-RETURN DEVICES

John C. Schultz, Buffalo, N.Y., assignor to Houdaille Industries, Inc., Ft. Lauderdale, Fla.

Filed Nov. 3, 1982, Ser. No. 438,748
Int. Cl.[3] B60G 13/00, 15/00; F16F 9/00, 11/00
U.S. Cl. 267—9 B 8 Claims



1. A linear stroke friction damped device adapted for resetting mechanism members which thrust relatively toward one another and must be reset by movement away from one another, and comprising:

an elongate housing having an internal cylindrical surface and a closure at one end of the housing equipped with means for attachment to one of said members;

an elongate reciprocable rod-like plunger having an end portion within said housing substantially spaced from said closure and with a substantial length portion of the plunger projecting from the opposite end of said housing for attachment to a second of said members;

said opposite end of said housing having an axially inwardly facing annular stop shoulder through which said rod length extends freely;

a set of coextensive elongate friction shoes engaging said cylindrical surface and having intermediately thereon substantially spaced apart oblique cam surfaces disposed in inwardly convergent planes;

one of the ends of said shoes being adapted to thrust separably against said annular stop shoulder;

a first shoe-expanding ring mounted loosely about said plunger and arranged to be thrust by a shoulder on the plunger against the cam surfaces which are nearest said annular shoulder;

a second shoe-expanding ring mounted loosely about said plunger and engaging the cam surfaces nearest said closure;

a coiled expansion spring concentric with said plunger and seated at one end against said closure and extending at its opposite end about said inner end portion of the plunger and applying thrust to said second shoe expanding ring and thereby thrusting said shoes endwise toward said stop shoulder;

and said plunger and said housing being relatively telescopically moveable when said members move relatively toward one another whereby said shoulder on said plunger causes said first shoe-expanding ring to move with said plunger for effecting axial shifting of said shoes away from said annular stop shoulder and toward said closure,

and said spring compresses between said closure and said second ring;

so that said friction shoes are progressively expanded for effecting minimal damping during the beginning of telescopic stroking relative movement of said housing and plunger, and then in the continuation of said stroking effecting progressively increasing frictional damping as stroking movement progresses toward end of telescopic stroke, said spring acting through said shoes and said rings, as an assembly, and said housing and said plunger for resetting said members.

4,505,459

LEAF SPRING ASSEMBLY FOR A VEHICLE

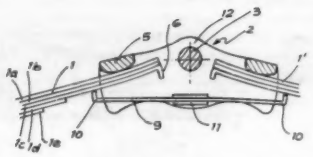
John Goth, 58 Lough Ave., Guildford, N.S.W., Australia 2161, and James Goth, 50 Arcadian Circuit, Carlingford, N.S.W., Australia (2118)

Filed Mar. 2, 1983, Ser. No. 471,244

Claims priority, application Australia, Mar. 12, 1982, PF3080

Int. Cl.³ B60G *11/12*; F16F *1/26*

U.S. Cl. 267—46 **3 Claims**



1. A spring assembly for a vehicle which comprises a main leaf spring having a hook at one end thereof; the end of the spring being slideably received in a boot; the boot comprising two opposed side members interconnected by an upper transverse member; and resilient retaining means mounted on the boot for preventing accidental withdrawal of the end of the spring from the boot during flexing of the spring, including resilient means for biasing the spring into sliding contact with the upper member and retaining means for engaging the hook when one limit of sliding travel is reached; the said resilient retaining means comprising a further leaf spring mounted on the boot at a lower end thereof, the free end of the further spring bearing against the main spring and including a hook for engaging the hook of the main spring.

4,505,460

LEAF SPRINGS OF COMPOSITE MATERIAL

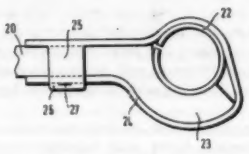
Raymond Le Gallais, Birmingham, England, assignor to GKN Technology Limited, Wolverhampton, England

Filed Jul. 9, 1982, Ser. No. 396,786

Claims priority, application United Kingdom, Jul. 15, 1981, 8121804

Int. Cl.³ F16F *1/26*

U.S. Cl. 267—54 R **7 Claims**



1. A leaf spring made of composite, fibre reinforced resin material and including at least one end fitting comprising:

a terminal portion of the spring shaped to define an open recess extending transversely of the spring;

a tubular attachment member lying within said recess, said attachment member affording a transverse aperture and having an external surface contacting said terminal portion of said spring over an arcuate contact area subtending at least a right angle at the centre of the attachment member;

a clamping member, in the form of a unitary element of strip material, embracing said attachment member and terminal portion of the spring and having portions lying against respective opposed surfaces of the spring adjacent said terminal portions thereof; and

securing means holding said portions of said clamping member together and to the spring, said securing means comprising an element extending transversely around the spring and said portions of the clamping member.

4,505,461

FLUID-FILLED ENGINE MOUNT DEVICE

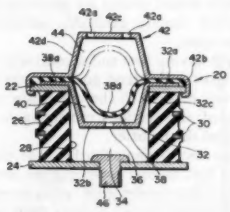
Toshihiko Kakimoto, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 2, 1981, Ser. No. 326,567

Claims priority, application Japan, Dec. 3, 1980, 55-170508; Feb. 2, 1981, 56-13898

Int. Cl.³ F16F *13/00*

U.S. Cl. 267—140.1 **10 Claims**



1. An engine mount device comprising:

first and second base plate members which are spaced from each other;

a block made of elastic material securely interposed between said first and second base plate members and formed with a cavity;

a partition wall member connected to said first base plate member and including a projecting section which projects into and is located within said cavity of said elastic block, said partition wall member defining within said cavity of said elastic block a fluid chamber to be filled with a fluid, said partition wall member being formed with an orifice; and

a diaphragm member connected to said partition wall member and including a projecting section which projects into and is located within said cavity of said elastic block, said diaphragm member further including a peripheral section at which said diaphragm member is connected to said partition wall member, said diaphragm member defining between it and said partition wall member an auxiliary chamber which communicates with said fluid chamber through said partition wall orifice, a major part of said auxiliary chamber being located within said cavity of said elastic block; and

said projecting section of said diaphragm member having a generally spherically projecting diaphragm section which is projectable in opposite directions with respect to the peripheral section of said diaphragm member.

4,505,462

ELASTOMERIC SHOCK AND VIBRATION ISOLATOR

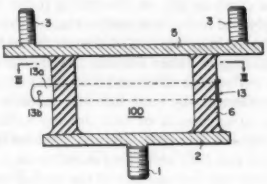
Takuya Dan; Isao Watanabe, and Tomoyuki Kurata, all of Yokohama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 5, 1982, Ser. No. 432,966

Claims priority, application Japan, Oct. 9, 1981, 56-149465[U]

Int. Cl.³ F16F 9/44

U.S. Cl. 267—140.2 20 Claims



7. An elastomeric shock and vibration isolator having a space formed therein, comprising:

a lower plate;

an upper plate;

a ring shaped rubber member arranged between said lower and upper plates and sealably connected thereto;

at least one tightening ring on an outer circumference of said ring shaped rubber member; and

adjusting means for adjusting a tightening force of said tightening ring against said ring shaped member to adjust the damping force and dynamic spring constant of the isolator.

4,505,463

JIG APPARATUS FOR USE WITH INDUSTRIAL ROBOTS

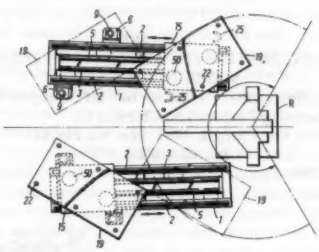
Seiji Hirai, Kawai, Japan, assignor to Kabushiki Kaisha Hirai Tekkosho, Osaka, Japan

Filed Jul. 15, 1983, Ser. No. 514,233

Claims priority, application Japan, Jul. 15, 1982, 57-108679[U]; May 16, 1983, 58-86471

Int. Cl.³ B23Q 1/04

U.S. Cl. 269—56 1 Claim



1. A jig apparatus for use with industrial robots, comprising a jig table (19) for clamping work, and a slide disk (15) adapted to be slid back and forth along guide rails (2) laid on an installation stand (1) placed on a workshop floor, wherein in order to assemble said jig table (19) from above to said slide disk (15) so that they can be integrally moved back and forth, a pawl disk (34) fixed to the upper surface of said slide disk (15) and a second pawl disk (28) fixed to the lower surface of said jig table (19) in opposed relation to said first pawl disk are removably engaged with each other by means of turnable hook segments (47) fitted on the outer peripheral surfaces of said two disks (28, 34), while a centering guide post (41) fixedly erected on the center of the pawl disk (34) on the slide table (15) is removably fitted in the central opening in the pawl disk (28) on the jig table (19) through point contact between balls (43) in a ball retainer (42) fitted on the guide post and a centering guide bushing (33) fitted in the central opening, said ball retainer (42) being constantly subjected to an upward resilient force.

4,505,464

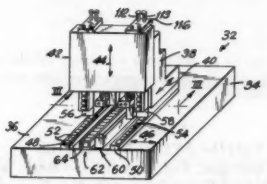
HIGH PRECISION WORKPIECE POSITIONING TABLE

Anwar Chitayat, Northport, N.Y., assignor to Anorad Corporation, Hauppauge, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,611

Int. Cl.³ B23Q 1/02

U.S. Cl. 269—73 13 Claims



1. A positioning table, comprising: a table;

means for supporting said table;

means for controlling movement of said table along an axis;

at least one flat way on said means for supporting having a first flat face in a plane normal to said axis;

at least a second flat way on said table having a second flat face parallel to said plane and facing said first flat face;

rollable bearing means between said first and second flat faces;

a first magnetic attraction element affixed to said table;

a second magnetic attraction element affixed to said means for supporting within an attractive magnetic influence of said first magnetic attraction element; and

said attractive magnetic influence of said first and second magnetic attraction elements including means for magnetically urging said first and second flat faces toward each other into contact with opposed sides of said rollable bearing means whereby said table is guided along said axis.

4,505,465

WOOD SPLITTER'S AID TOOL

Frank R. McCrary, 6606 Wing Point Rd., Bainbridge Island, Wash. 98110

Continuation-in-part of Ser. No. 249,380, Mar. 31, 1981, abandoned. This application Apr. 7, 1983, Ser. No. 482,849

Int. Cl.³ B25B 1/04

U.S. Cl. 269—130 7 Claims

1. A wood splitter's aid tool comprising:

(a) an elongated, elastically stretchable, flexible member adapted to encircle a length of firewood to be split with an axe, said elongated member comprising a stretchable elastic cord element connected serially with a length of a chain;

(b) said elastic cord element having a fastener element on one end adapted to releasably engage said chain at a selected point, of a plurality of such points, along the length of said chain intermediate the ends thereof, so that said elongated member under elastic tension may tightly encircle the length of firewood yet have further elastic yieldability in said elastic cord element of said elongated member; and

(c) a flexible tubular sheath of non-slip material lengthwise through which at least a portion of the length of said stretchable elastic cord element extends protected, said

flexible tubular sheath adapted to be pressed by tension in the elongated member against the side of the firewood

being split so as to reduce a tendency of the encircling elongated member to slide down the firewood.

4,505,466

CLOTH-LAYING MACHINES

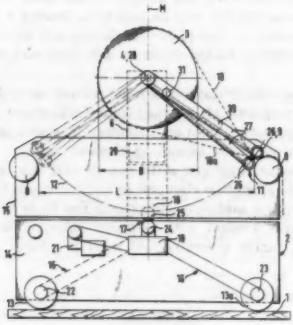
Albert Buss, Münsingen, Fed. Rep. of Germany, assignor to Bullmerwerk Karl Bullmer, Musingen, Fed. Rep. of Germany

Continuation of Ser. No. 100,694, Dec. 5, 1979, abandoned. This application Jan. 5, 1982, Ser. No. 337,180

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852797

Int. Cl.[3] **B65H** *29/46*

U.S. Cl. 270—31 **11 Claims**



1. A cloth-laying machine comprising a laying carriage positioned above a cloth-laying surface, a cloth supply roll positioned above said carriage, said cloth supply roll having cloth disposed thereon, said cloth having an end extending downwardly from a side of said roll, means for entraining and transporting said end from said roll to a gap between a deflecting roller and an unwinding roller, said rollers being remotely positioned from the cloth supply roll, said unwinding roller having means to draw cloth from the cloth supply roll along a path to said gap, said means for entraining and transporting said end comprising an endless conveyor which is positioned below the supply roll to transport the cloth end from said cloth supply roll to the deflecting roller and uwinding roller located next to an end of the conveyor, the deflecting roller and the unwinding roller being positioned adjacent to each other and forming a nip therebetween including the gap for receipt of the end of the cloth, said deflecting roller being positioned along said path upstream of said unwinding roller so that the end engages the deflecting roller before it engages the unwinding roller to produce a desired amount of wrap of cloth about the surface of the unwinding roller, the unwinding roller causing the withdrawal of the cloth from the supply roll in a manner producing a tension-free laying of the cloth on the cloth-laying surface and the deflecting roller serving to produce the necessary wrapping angle of the cloth on the unwinding roller, and the endless conveyor adapted to automatically engage the end of the cloth regardless of the side of the supply roll from which the end extends and to direct the end to either end of the laying carriage for engagement with an unwinding roller and a deflecting roller.

3. A cloth-laying machine, comprising a laying carriage adapted for reciprocating movement over a cloth-laying surface and arranged to support in a predetermined position a supply of a cloth web on a roll, the laying carriage comprising, laterally of the cloth supply, an unwinding roller to draw cloth from the supply and to lay it on said surface, a driving member to entrain a freely hanging end of the cloth, and a deflecting roller, said driving member feeding the freely hanging end between said deflecting roller and said unwinding roller, the improvement comprising said driving member (**11**) being formed by an arrangement of two driving rollers (**26**) each mounted on a pivot arm (**27**), pivoted relative to a common horizontal pivot axis (**28**), and being movable on a path extending up to at least one end surface of the laying carriage (**2**) at which is arranged said uwinding roller (**8**) in a horizontal position, said path having a length (L) within which can engage the freely hanging end of the cloth web (**10**) from the cloth supply roll (**3**), and also encompassing substantially 180° relative to a vertical axis (A) and the cloth supply roll (**3**).

8. A cloth-laying machine, comprising a laying carriage adapted for reciprocating movement over a cloth-laying surface and arranged to support in a predetermined position a supply of a cloth web on a roll, the laying carriage comprising, laterally of the cloth supply, an unwinding roller to draw cloth from the supply and to lay it on said surface, a driving member to entrain a freely hanging end of the cloth, and a deflecting roller, said driving member feeding the freely hanging end between said deflecting roller and said unwinding roller, the improvement comprising said driving member (**11**) being formed by an endless air permeable conveyor belt (**39**) in which an air suction arrangement (**42**) is arranged below an upper run (**41**) of said conveyor belt, and being movable on a path extending up to at least one end surface of the laying carriage (**2**) at which is arranged said unwinding roller (**8**) in a horizontal position, said path having a length (L) within which can be engaged the freely hanging end of the cloth web (**10**) from the cloth supply roll (**3**), and also encompassing substantially 180° relative to a vertical axis (A) and the cloth supply roll (**3**).

4,505,467

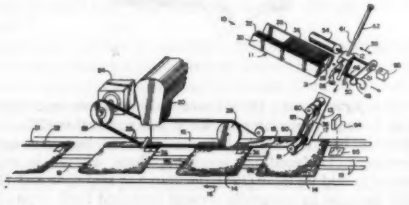
LABEL DISPENSER WITH SUCTION HOLD AND FORK MEMBER RELEASE

Charles E. Brocklehurst, Fountain Inn, S.C., assignor to Opelika Manufacturing Corporation, Chicago, Ill.

Filed Aug. 1, 1983, Ser. No. 519,483

Int. Cl.[3] **B42B** *1/02*

U.S. Cl. 270—53 **17 Claims**



1. A method of dispensing labels and the like from the end of a stack of labels to a work product comprising applying the opening of a conduit to one surface of the end label in the stack, drawing suction in the conduit, moving the conduit away from the stack so that the end label clings to the opening of the

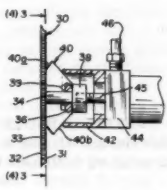
conduit and moves with the conduit away from the stack, urging the label clinging to the conduit in a direction approximately parallel to the plane of the label off the opening of the conduit, and moving the label from the opening of the conduit to the work product.

4,505,468

APPARATUS FOR ENGAGING AND MOVING CORRUGATED PAPERBOARD PORTIONS BY RECIPROCATED PINS

Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J. 07417

Filed May 16, 1983, Ser. No. 494,960
Int. Cl.³ B65H *3/22*
U.S. Cl. 271—18.3 **47 Claims**



1. Apparatus for engaging and retaining a paperboard member by a plurality of sharpened pin ends disposed to penetrate and engage facing surface of said paperboard member during a transfer motion and after transfer has been completed to release said paperboard member, this apparatus including:

(a) a reciprocable body retainer member and means for moving said retainer member to and from said paperboard member;

(b) a plurality of sharpened pin end members carried by said body member and means for moving said pin end members under controlled conditions to and into facing surface of the paperboard member at an engaging and retaining angle while the other end of said sharpened pin end members are retained in a fixed array in this body member;

(c) a sensing member carried by the reciprocable body member and adapted to engage an outer surface of a paperboard member and remain in said engaged condition during actuation of the sharpened pin members;

(d) movable means carried by said reciprocable body member for advancing the sharpened ends of the pin members a determined amount into the contiguous surface of the paperboard member engaged by said sensing member so that the sharpened ends of the pin members enter the facing surface of the paperboard member at an angle which is less than normal to the facing surface of the paperboard member and sufficient to releasably engage and retain this paperboard member;

(e) means for limiting the advance of the sharpened ends of the pins into the paperboard member so as not to penetrate a rear panel portion of the paperboard member sufficiently so as to extend therefrom;

(f) means for maintaining the controlled depth of penetration of the paperboard member by the sharpened ends of the pin members during the desired transfer movement of the reciprocable body member, and

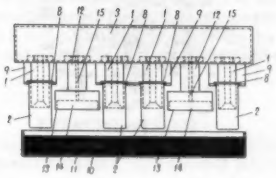
(g) means for effecting a release of the sharpened pin ends from the engaged and penetrated paperboard member after the desired transfer motion.

4,505,469

PAPER FEEDING APPARATUS

Atsushi Kakimoto, Yao; Masaaki Takita, Ibaragi, and Shinichi Watanabe, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP82/00127, § 371 Date Dec. 21, 1982, § 102(e) Date Dec. 21, 1982, PCT Pub. No. WO82/03617, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 19, 1982, Ser. No. 456,048
Claims priority, application Japan, Apr. 21, 1981, 56-61071
Int. Cl.³ B65H *3/40*
U.S. Cl. 271—91 **8 Claims**



1. Apparatus for feeding paper, sheet by sheet, from a pile of such paper, to a processing station at which information is to be recorded thereon,

said apparatus comprising:

wall means defining a duct which is constructed and arranged to be communicated to a suction-drawing air pump;

at least one generally vertically downwardly-directed suction pipe secured to said duct;

each said suction pipe having means defining a longitudinal bore therein having an upper end opening into said duct and a lower end opening downwardly outside said duct;

at least one at least generally vertically-oriented suction head having a downwardly-opening suction aperture disposed in a generally horizontal suction plane;

means mounting each such suction head relative to said duct for limited, at least generally vertical, travel between a defined lowermost position, and an upper position;

each such suction head being telescopically generally vertically slidingly received on a lower end portion of a respective said suction pipe in such a manner as to enclose respective said lower end of a respective said suction pipe, thereby defining within each said suction head between the respective said suction pipe lower end and the respective said suction aperture, a suction chamber;

each suction head being of a weight which is slightly greater than that needed to counterbalance the tendency of air being sucked into the respective said suction chamber when said apparatus is in use to cause that suction head to rise from said lowermost position thereof so that,

(a) when each said suction head has the respective said aperture thereof open and not blocked by confrontation with a surface of a sheet of paper, such suction head tends to assume and mainain said lowermost position thereof under the influence of gravity, but

(b) when each suction head has the respective said aperture thereof closed and blocked by confrontation with a surface of a sheet of paper, such suction head tends to rise to said upper position thereof;

at least one holding pipe communicated to said duct and having a downwardly opening aperture which is constructed and arranged to grip by suction a sheet of paper elevated to said upper level on said at least one suction head;

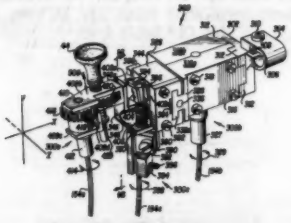
the fluidic resistance of air path through each said holding pipe from said aperture thereof to said duct being greater in sum than the fluidic resistance of air path through each said suction head from said aperture thereof to said duct.

4,505,470

DOCUMENT HANDLING MACHINE HAVING REMOTE ADJUSTMENT MECHANISM

Warren Reinert, and George Fallos, both of Easton, Pa., assignors to Bell & Howell Company, Phillipsburg, N.J.

Filed Sep. 30, 1982, Ser. No. 429,891
Int. Cl.³ B65H 3/08
U.S. Cl. 271—100 **14 Claims**



1. Apparatus for adjusting a feeding means associated with a hopper of a document handling machine, said feeding means comprising a sucker cup mounted on a rotatable threaded stem; said sucker cup communicating through a channel in said threaded stem to a vacuum line, said apparatus comprising:

adjusting means for adjusting said feeding means with respect to an axis thereof, said means for adjusting said feeding means further comprising:

connector means;

first gear means attached to said connector means; and,

second gear means adapted to cooperate with said first gear means, said second gear means further being adapted to rotate and to convert said rotary motion into translation of said feeding means along said axis, said second gear means having a central, counter-threaded bore adapted to receive said threaded stem, whereby said stem translates along said axis as said second gear rotates;

elongated flexible cable means having one end thereof attached to said connector means of said adjusting means and the other end thereof affixed to a remote location on said document feeding machine; and,

means at the remote end of said elongated flexible cable means for selectively moving said elongated flexible cable means by an amount corresponding to the desired motion of said adjusting means with respect to said axis thereof, whereby said feeding means can be adjusted from said remote location.

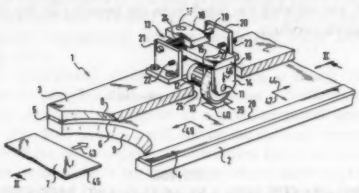
4,505,471

DEVICE FOR FEEDING DATA SUPPORTS IN A PROCESSING ARRANGEMENT

Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen, and Siegfried Bauer, Kussenhofstr. 16, D-7743 Furtwangen, both of Fed. Rep. of Germany

Continuation of Ser. No. 284,061, Jul. 16, 1981, abandoned. This application Dec. 27, 1983, Ser. No. 565,135
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034517
Int. Cl.³ B65H 9/16
U.S. Cl. 271—251 **16 Claims**

1. A device for feeding a card-type data support in a processing arrangement having a receiving zone for receiving said data support with a baseplate forming the bottom of the receiving zone, a lateral guidestrip forming an abutment edge and an opening for insertion of said data support, the device further comprising driving means for moving said data support, said driving means comprising a driving wheel rotatable around a driving shaft which is arranged to lie on a straight line passing through an axis normal to said baseplate and to be pivotable around that axis, said axis being deposited at one side of said receiving zone and said driving wheel being offset from that axis towards the center of said receiving zone and biased towards said baseplate, whereby said driving shaft is pivoted



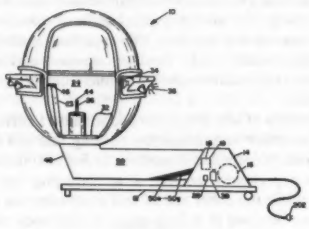
around that axis by the rolling movement of said driving wheel on said baseplate.

4,505,472

ASTRO CAPSULE

Allan L. Lorenc, Oelwein, and Thomas L. Maring, Cedar Rapids, both of Iowa, assignors to Rawson Control Systems Inc., Oelwein, Iowa

Filed Dec. 28, 1982, Ser. No. 454,038
Int. Cl.³ G09B 9/08
U.S. Cl. 272—1 C **15 Claims**



1. Astro capsule comprising:

a. frame support means including a main frame and a raisable four-bar linkage having one end rotatably secured to said main frame and a capsule body rotatably supported on an other end of said linkage;

b. hydraulic means including a motor-driven hydraulic pump, a reservoir, plurality of configured valve means connected thereto in a hydraulic circuit, a first hydraulic cylinder connected between said main frame and a midpoint of said four-bar linkage to provide for vertical lift of said capsule body, and a second and third hydraulic cylinder for rotating said capsule body;

c. stop means for limiting distance of travel of said four-bar linkage;

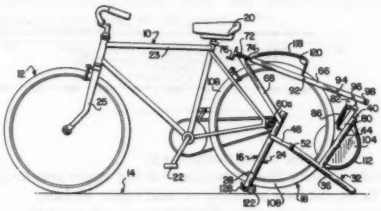
d. joystick means including four positions of movement positioned at said other end of said four-bar linkage and including linkage means mechanically connected to said valve means for control of said first hydraulic cylinder and electrically connected to said valve means for control of said second and third hydraulic cylinders; and,

e. said capsule body mounted about said joystick means whereby said hydraulic cylinders when actuated provides simulated space flight.

4,505,473
CYCLE SUPPORT FOR EXERCISING

George M. Pro, 9307 Lee Blvd., Leawood, Kans. 66206

Continuation of Ser. No. 339,625, Jan. 15, 1982, abandoned, which is a continuation of Ser. No. 136,173, Mar. 31, 1980, abandoned. This application Apr. 10, 1984, Ser. No. 598,400
Int. Cl.³ A63B 21/00
U.S. Cl. 272—73 10 Claims



1. In an exerciser for simulating bicycling:
framework having pedal means and a driven wheel propelled in response to foot power exerted on the pedal means by a rider mounted on the framework,
said wheel having an axle;
a stand adapted to rest on a supporting surface therefor;
an energy storing, inertia member spaced above said surface alongside the wheel and having a rotatable driven element extending therethrough and fixed thereto,
said member and said element having a common axis of rotation;
mounting means attaching the element to the stand for rotation of the member and the element about said axis; and
connecting means on the stand attaching said axle thereto and holding the wheel suspended above and out of engagement with said surface and rotation about an axis in parallelism with said common axis of the member and element,
said element being disposed for rolling engagement with the periphery of the wheel whereby rotative power is transmitted to the element from the wheel during rotation of the wheel by said pedal means,
said mounting means including a pair of spaced, resilient, vibration dampening mounts carried by the stand, said element having means extending through the mounts.

4,505,474
WEIGHTED ELASTOMERIC JUMPING DEVICE

Ernest M. Mattox, 1683 Leonard, NW., Grand Rapids, Mich. 49504

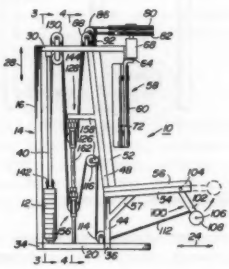
Filed May 25, 1984, Ser. No. 614,329
Int. Cl.³ A63B 5/20
U.S. Cl. 272—75 18 Claims

1. An exercise device, comprising:
a pair of spaced handles;
an elongated, flexible cord joined to said handles, said flexible cord being resiliently elongatable at least in the regions adjacent said handles as said flexible cord is revolved around a person, said flexible cord comprising a hollow, resilient elastomeric cord extending between said handles;
a tubular sleeve received around at least a portion of said flexible cord, said sleeve being relatively freely rotatable about said flexible cord;
each said handle comprising a cylindrical plug received within and enveloped by one end of said elastomeric cord; and
means for weighting said flexible cord, said weighting material being a granular material located within said flexible cord so as to be shiftable therein, whereby as said exercise device is revolved around a user said elongatable, flexible cord forms a variable moment arm between the center of gravity of said weighting means and said handles.

4,505,475
EXERCISE SYSTEM

Brad Olschansky, 8415 Bellona La., Apt. 613, Towson, Md. 21204, and Scott Olschansky, 5219 Overhill Rd., Baltimore, Md. 21207

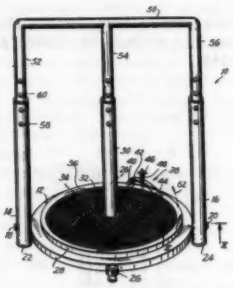
Filed May 27, 1983, Ser. No. 498,886
Int. Cl.³ A63B 21/06, 23/02, 23/04
U.S. Cl. 272—118 17 Claims



1. An exercise system for reversibly displacing at least one predetermined weight element responsive to a lifting force imparted to said weight element by a user, comprising:
(a) an exercise frame member;
(b) arm actuated means secured to said exercise frame member and coupled to said weight element for reversibly displacing said weight element responsive to a displacement of at least one arm of said user, said arm actuated means including a pair of arm bar members rotatable about a substantially vertical axis, a pair of arm pulley members fixedly secured to said arm bar members and rotatable therewith, and an arm cable member fixedly secured on opposing ends thereof to each of said arm pulley members;
(c) leg actuated means secured to said exercise frame member and coupled to said weight element for reversibly displacing said weight element independently of a displacement of said arm actuated means, said arm actuated means being displaceable independent of a displacement of said leg actuated means; and,
(d) exercise means secured to said exercise frame member and said weight element for coupling said arm actuated means to said leg actuated means for providing said lifting force to said weight element responsive to (1) a combined displacement of said arm actuated means and said leg actuated means, (2) an independent displacement of said arm actuated means, and, (3) an independent displacement

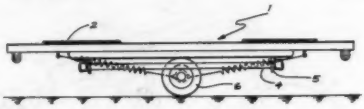
of said leg actuated means, said arm cable member being coupled to said exercise coupling means for displacement of said weight element.

4,505,476
PORTABLE EXERCISER
Ben Rubin, 37 S. Iowa Ave. #6B, Atlantic City, N.J. 08401
Filed Aug. 30, 1982, Ser. No. 412,554
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—146 **2 Claims**



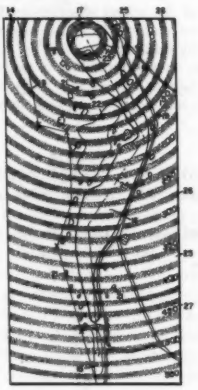
1. A portable exerciser comprising:
a platform;
a generally circular rotatable disc on said platform;
an opening centrally disposed in said rotatable disc;
a center post fittable into said opening;
first and second side posts at opposed edges of said platform;
first and second hingeable means for permitting rotation of said first and second side posts about an axis joining said first and second hingeable means;
said first and second side posts being extended downward past said platform and including means for supporting said platform above a surface;
at least one auxiliary leg on said platform angularly spaced from said first and second side posts and including means extending downward from said platform for supporting said platform above said surface;
said at least one auxiliary leg including means for permitting changing of a length thereof whereby said platform may be tilted about said axis;
a hand grip rod;
first, second and third post support rods affixed to said hand grip rod and engageable with said first and second side posts and said center post for support of said hand grip rod at a distance above said platform;
means in at least some of said first and second side posts, said center post and said first, second and third support rods for permitting adjustment of said distance;
an upper surface on said disc adapted for permitting running thereon; and
means for permitting said disc to rotate with a predetermined resistance about said center post whereby a person may hold said hand grip rod and run on said upper surface for obtaining exercise therefrom.

4,505,477
BALANCING BOARD
John M. Wilkinson, 43 Morts Rd., Mortdale, New South Wales, Australia (2223)
Filed Jul. 7, 1983, Ser. No. 511,437
Claims priority, application Australia, Jul. 9, 1982, PF4790; Feb. 7, 1983, PF7916
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—146 **5 Claims**



1. A balancing board comprising:
a substantially planar member having upper and lower surfaces, the user standing on said upper surface;
a set of tracks located on the lower surface of the substantially planar member, each said track comprising two rods rotatably mounted to the lower surface of said planar member at a distance away from said lower surface, each said track including a wheel-engaging running surface;
a set of wheels adapted to run along said running surfaces and between said two rods; and
means for biasing said set of wheels towards a central position substantially midway along the length of the planar member.

4,505,478
GOLFER'S AID
Mark R. Riethmiller, 122 Moonlight Ter., San Antonio, Tex. 78233
Filed Jul. 8, 1982, Ser. No. 396,495
Int. Cl.³ A63B *67/02*
U.S. Cl. 273—32 H **20 Claims**



1. A device for estimating distances of consequence to a golf player on a golf hole from substantially any point thereon, comprising:
An aerial photographic representation of a golf hole including a tee area, a green and other topographical features thereof;
a first and second plurality of substantially transparent concentric circular bands disposed in an alternating light and dark sequence and superimposed on said representation, each band comprising inner and outer boundaries respectively defined by at least segments of two circles, the

centers of which lie at a point on the green on said representation, said plurality of bands being uniformly distributed over at least a portion of the length of the golf hole representation beginning at an area proximate the green thereof, wherein the width of all of said bands is substantially constant and said band width corresponds to a predetermined unit of measurement on said representation;

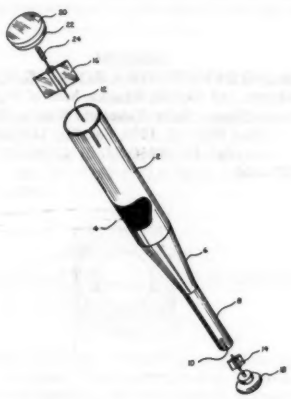
and indicia means on said representation associated with selected concentric bands for identifying the respective representative distances from said selected concentric bands to the center of the green.

4,505,479

WEIGHTED BAT WITH WEIGHT SECURING MEANS

Roger B. Souders, 10180 Eagle Rock Ave., San Diego, Calif. 92126

Filed Dec. 28, 1982, Ser. No. 437,953
Int. Cl.³ A63B 59/06
U.S. Cl. 273—72 A **6 Claims**



1. A bat comprising:

(a) an elongated aluminum shell having a handle portion, an intermediate portion and a striking portion, the handle portion being suitable for gripping, the striking portion being suitably larger in diameter than the handle portion, and the intermediate portion being integral with and joining the handle portion and the striking portion,

(b) a cap means for closing the striking portion and for imparting a desired weight to the bat,

(c) means for securing the cap means to the shell,

(d) a knob means for closing the handle portion and for preventing the bat from unintentionally slipping through the hands of a batter,

(e) a stud receiving means disposed at the open end of the handle portion,

(f) a stud means for securing the knob means to the stud receiving means,

(g) a plurality of fins extending radially outward from the stud receiving means, and

(h) a plurality of slots defined by the shell and located at the handle portion of the shell, said fins being secured in said slots.

4,505,480

TENNIS RACKET HAVING ALVEOLI FILLED HONEYCOMB REINFORCEMENT

Jan E. Vanhoutte, Brugge, Belgium, assignor to Fabrique Nationale Herstal, Belgium

Filed Mar. 23, 1983, Ser. No. 477,960
Claims priority, application Belgium, Aug. 31, 1982, 2/59816
Int. Cl.³ A63B 49/04
U.S. Cl. 273—73 C **4 Claims**

A tennis racket having a honeycomb structure wherein selected alveoli of the honeycomb are filled with a high density material and a binder in accordance with the invention.

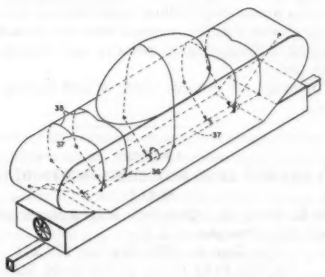
4. A frame for a tennis racket defined in part by a honeycomb core surrounded by a casing of aluminum alloy, the improvement comprising at least one selected alveolus of the honeycomb core being filled with a mixture of zinc powder and an organic binder.

4,505,481

INFLATABLE TARGET APPARATUS

Lindsay C. Knight, Albury, Australia, assignor to Australasian Training Aids (Pty.) Ltd., Albury, Australia

Filed Jul. 6, 1983, Ser. No. 511,304
Claims priority, application United Kingdom, Jul. 6, 1982, 8219547
Int. Cl.³ F41J 5/04, 9/02
U.S. Cl. 273—348.1 **55 Claims**



1. A target apparatus comprising:

a bag formed of flexible material;

means for inflating said bag; and

a projectile detection means disposed within said bag for detecting a projectile hit on the inflated bag, the projectile detection means comprising a transducer arrangement responsive to an airborne pressure wave gencrated when a projectile passes through the inflated bag, said transducer arrangement being operable to discriminate between projectile hits and misses and to discriminate between pressure wave energy levels, above a minimum threshold level, created by projectiles of different caliber.

4,505,482

ARCHERY BROADHEAD

Ricky T. Martin, Sr., 6065 Hathaway Rd., Lebanon, Ohio 45036

Filed Nov. 7, 1983, Ser. No. 549,042
Int. Cl.³ F41B 5/02
U.S. Cl. 273—421 **20 Claims**

20. In an improved broadhead comprising a ferrule for mounting said broadhead on a shaft and a plurality of blades mounted on said ferrule and projecting outwardly therefrom in plane substantially coincident with a longitudinal axis of said ferrule, the improvement comprising:

each of said blades including a first leading portion and a second, trailing portion;

said first, leading blade portion having a straight outer edge extending rearwardly from an acutely angled point thereof and defining with said longitudinal axis of said ferrule a first, acute included angle;

said second, trailing blade portion having a straight outer edge defining with said longitudinal axis of said ferrule a second acute, included angle;

said second acute, included angle being at least twice as great as said first acute, included angle;

said acutely angled points of said leading blade portions merging to form an integral, acutely angled, needle-like penetrating point;

a forwardmost point on said outer edge of said second trailing blade portion coinciding with a rearwardmost point on said outer edge of said first leading blade portion;

said trailing blade portions each having a substantially straight inner edge portion defining with an outer surface of said ferrule substantially triangularly-shaped openings;

said leading blade portion being substantially londer than said trailing blade portion;

the distance from said ferrule longitudinal axis to the outermost point on said trailing blade portion being substantially greater than the distance from said ferrule longitudinal axis to the outermost point on said leading blade portion; and

vent openings are provided only at said trailing blade portions.

4,505,483

INFLATABLE SEAL FOR OPENING IN BUILDING WALL

Kenneth R. Bent, Jr., Coventry, R.I., assignor to Gilmore-Kramer, Inc., Providence, R.I.

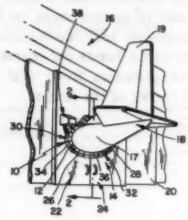
Filed Jan. 16, 1984, Ser. No. 571,351
Int. Cl.³ F16J 15/02, 15/46; E06B 7/22
U.S. Cl. 277—34 **4 Claims**

1. An inflatable seal for sealing the area between the perimeter of an opening in a wall of a building and a vehicle body received in the opening comprising:

a. an inflatable member mounted on said building wall in said opening and inflatable from a collapsed disposition to an expanded disposition wherein it projects inwardly into said opening for sealing engagement with the outer surfaces of the walls of said vehicle body;

b. means for inflating said inflatable member; and

c. means resiliently retracting said inflatable member to a position adjacent the perimeter of said opening when said inflating means is deenergized, said resilient retracting means comprising a plurality of resilient recoil members attached to said inflatable member, said resilient recoil members being disposed in substantially straightened positions thereof wherein they extend inwardly into said opening when said inflatable member is in the expanded



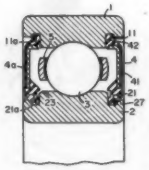
disposition thereof and resiliently curled normal positions thereof wherein they are positioned adjacent the perimeter of said opening to retract said inflatable member when it is in the collapsed disposition thereof.

4,505,484

SEALING DEVICE FOR A ROLLING BEARING

Takeo Ohkuma, and Akihiko Tanaka, both of Fujisawa, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1980, Ser. No. 129,678
Int. Cl.³ F16C 33/76, 33/80
U.S. Cl. 277—94 **9 Claims**

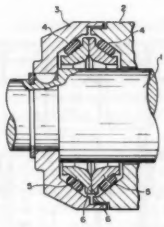


1. A device for sealing the clearance between an outer race and an inner race of a rolling bearing; including a seal member having one side thereof adapted to be held by the outer race and the other side thereof adapted to fit within a concave groove formed in the outer peripheral surface of said inner race; said outer side of said seal member including an inner lip extending axially inward of the bearing and adapted to be spaced from the inner shoulder of said groove a distance sufficiently small to form a non-contact seal with said inner shoulder; an outer lip extending radially of said bearing and adapted to cooperate with the outer shoulder of said groove to form an outer seal with the outer shoulder; and means including an intermediate lip extending between said inner lip and said outer lip and divided to form seal surfaces extending respectively towards opposite side walls of said groove for providing two seal surfaces of said intermediate lip each adapted to engage respective ones of the side walls of said groove alternatively with the inner of said seal surfaces contacting the innermost of said groove walls when said seal member is in its innermost axial position and the outer of said seal surfaces contacting the outermost of said groove walls when said seal member is in its outermost axial position.

4,505,485
ROTARY SEAL WITH LINEAR WEAR RESISTANT TREATED LAYER

Osamu Hirakawa, Saitama, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1983, Ser. No. 502,064
Claims priority, application Japan, Jun. 7, 1982, 57-83490[U]
Int. Cl.³ F16J 15/26, 15/34
U.S. Cl. 277—96.1 8 Claims



1. A rotary seal for sealing between two relatively rotatable surfaces, comprising; at least one rotary seal surface having a wear resistant treated layer, said wear resistant treated layer formed on the rotary seal surface being of a linear form, said linear wear resistant treated layer being formed obliquely with respect to the circumferential direction of said seal surface.

4,505,486
MECHANICAL FASTENER FOR INTAKE MANIFOLD GASKET

Andrew R. Skrycki, Riverview, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Aug. 24, 1984, Ser. No. 643,993
Int. Cl.³ F16J 15/12; F02B 77/00
U.S. Cl. 277—235 B 4 Claims

1. A gasket assembly comprising a gasket; an opening formed in the gasket; and a mechanical fastener assembly mounted in the opening; the mechanical fastener assembly including a first metal member having a central opening formed therein and a bowed-out peripheral edge portion mounted on the edge portion of the opening on one side of the gasket, and a second metal member having a bowed-out peripheral edge portion mounted on the edge portion of the opening on the other side of the gasket, and a projection formed in the central portion thereof extending through the central opening of the first metal member and including a peripheral retainer flange around the edge portion of the central opening.

4,505,487
DEAD STOP FOR COLLET CHUCKS

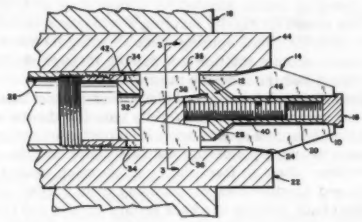
Paul A. Davignon, Uxbridge, and Michael G. Duclos, Ashland, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Feb. 16, 1982, Ser. No. 349,104
Int. Cl.³ B23B 31/20
U.S. Cl. 279—1 S 5 Claims

1. A workpiece dead stop for collect chucks comprising:

a main body having hollow elongated neck portion extendable into the work-receiving end of a conventional multiply longitudinally slotted collet chuck, the terminus of said neck providing a precision stop for workpieces inserted into said work-receiving end of said collet chuck;

said main body of said dead stop further including a plurality of radially adjustable fin members each adapted to extend laterally through a one of said slots of said collet chuck; and

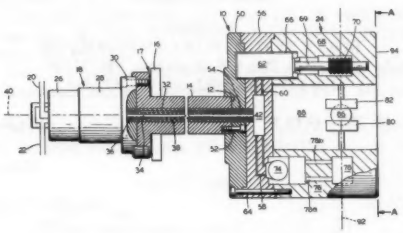


means within the elongated neck portion for selectively moving said fin members radially outwardly through said collet chuck slots for locking said dead stop against an inner wall of hollow machine spindle when said dead stop and collet chuck are assembled and positioned in said spindle, said collet chuck remaining free for selective closing of said work-receiving end by pullback in said spindle.

4,505,488
AUTOMATIC INDEXING CHUCK

James W. Balfe, 190 Mountain St., Rockville, Conn. 06066

Filed Sep. 27, 1982, Ser. No. 424,190
Int. Cl.³ B23B 31/34
U.S. Cl. 279—5 13 Claims



1. A chuck of the indexing type comprising a chuck housing having a top plate adapted for accommodating indexing means for rotating a workpiece within the chuck housing;

an index assembly housing disposed within the top plate for rotating the workpiece and adapted for removable insertion within the top plate, an indexing shaft adapted for rotation within the index assembly housing, a wheel gear fixedly attached to the indexing shaft and adapted for engagement with means for rotating an indexing jaw;

means for locking the indexing shaft at each rotational position;

a cam plate fixedly attached to the indexing shaft and adapted for rotation therewith;

a plurality of cam lobes disposed about the outer diameter of the cam plate in an angular spaced-apart relationship from one another;

a plurality of switches disposed in a spaced-apart vertical relationship to the cam lobes and adapted for synchronous engagement therewith as the cam lobes rotate with the indexing shaft;

means for transmitting electrical signals from the switches to

means for controlling the angular rotation of the indexing shaft;

a bottom plate disposed in a spaced-apart parallel relationship to the top plate and adapted for accommodating clamping means for rigidly holding a workpiece within the chuck housing;

clamping means disposed within the bottom plate said clamping means adapted for cooperating with the indexing means for rigidly securing a workpiece therebetween within the chuck housing while allowing the workpiece to rotate about a rotation axis passing through the clamping means and the indexing means;

a pair of side plates disposed in a spaced-apart relationship to one another adapted for rigidly securing the top and bottom plates in a spaced-apart relationship to one another;

means for rigidly securing the side plates and the top and bottom plates to form the chuck housing having the enlarged aperture therein extending from a front surface of the chuck housing to a back surface thereof and symmetrically disposed about a centerline axis passing axially through the chuck housing, said aperture having dimensions sufficient to accommodate a workpiece therein;

a back plate fixedly attached to a back surface of the chuck housing adapted for attachment to means for rotating the chuck housing about the centerline axis;

an indexing jaw disposed within the enlarged aperture proximate the front surface of the chuck housing removably attached to the indexing means for rotating the indexing jaw about an axis orthogonal to the centerline axis and passing through the top and bottom plates;

a clamping jaw disposed within the enlarged aperture diametrically opposed the indexing jaw and removably attached to the clamping means when the indexing and clamping jaws are adapted for rigidly holding a workpiece therebetween;

means for activating the indexing means;

means for activating the clamping means; and

means for controlling the rotation of the indexing jaw.

4,505,489

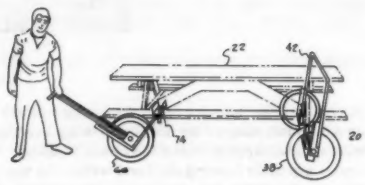
DOLLY SYSTEM FOR CAMPGROUNDS

Roy L. Specie, P.O. Box 635, Bradenton, Fla. 33506

Filed Dec. 23, 1982, Ser. No. 452,412

Int. Cl.³ B62B *1/12*

U.S. Cl. 280—47.13 R **10 Claims**



1. A picnic table dolly, comprising:

(a) an adjustable width, open channel support frame adapted for supporting the legs on one end of the picnic table to be moved;

(b) a pair of essentially U-shaped open wheel housings, each fixedly attached to one end of said adjustable width, open channel support frame;

(c) a pair of rubber tired wheels, each rotatably mounted in one of said essentially U-shaped open wheel housings above the level of said adjustable width, open channel support frame; and

(d) an elongated adjustable length handle, one end of which is fastened to one of said essentially U-shaped open wheel housings and the other end of which is fastened to the other of said essentially U-shaped open wheel housings, said handle extending above and parallel to said adjustable width, open channel support frame at a height which is greater than the height of the picnic table to be moved.

4,505,490

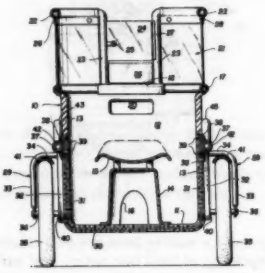
JOGGING CART

Jerome R. Plugge, Cordova, Md., assignor to Marcel G. Talbot, Chester, Md.

Filed Sep. 30, 1982, Ser. No. 432,014

Int. Cl.³ B62C *1/08*

U.S. Cl. 280—63 **9 Claims**



1. In a jogging cart, a driver's shell having a driver access and egress opening and including side walls and a floor, wheel mounts on opposite sides of said shell exteriorly of said side walls, a support strap for the shell extending across the floor of the shell and upwardly along the side walls of the shell for substantial distances, and fastener means rigidly interconnecting opposite sides of the support strap with the wheel mount, each said wheel mount further including an interior substantially vertical mounting bar substantially engaging the exterior face of one shell side wall and including a parallel exterior bar, a single wheel supported and journaled on each mount between the interior and exterior bar, and wherein said fastener means connects the interior mounting bar of each wheel mount with one side wall of the shell.

4,505,491

STEERING SYSTEM FOR VEHICLES

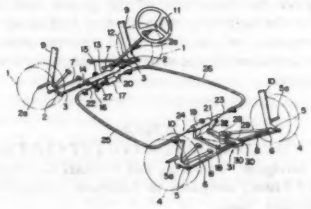
Shoichi Sano, Tokyo, and Yoshimi Furukawa, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 478,699

Claims priority, application Japan, Mar. 25, 1982, 57-47743; Mar. 30, 1982, 57-52161

Int. Cl.³ B62D *7/14*

U.S. Cl. 280—91 **12 Claims**



1. A steering system for a vehicle including steerable front and rear wheels, comprising:

a steering wheel;

a front wheel steering mechanism operatively cooperating with said steering wheel so as to steer said front wheels in

accordance with a rotating movement of said steering wheels;

a movement transmission mechanism operatively cooperating with said steering wheel so as to convert said rotating movement of said steering wheel into, and rearwardly transmit, a push-pull movement and output same in the form of a transverse movement;

a rear wheel steering mechanism operatively cooperating with said movement transmission mechanism so as to steer said rear wheels in accordance with said transverse movement;

said movement transmission mechanism comprising a first converting mechanism for converting said rotating movement of said steering wheel into said push-pull movement, rearward transmission means for rearwardly transmitting said push-pull movement and a second converting mechanism for converting said push-pull movement into said transverse movement;

said first converting mechanism comprising a substantially vertically extending shaft interlocked to be rotatable with said steering wheel, and a lever member having a proximal end connected to said shaft and a distal end operatively connected to said rearward transmission means, said lever member being rotatable in a substantially horizontal plane;

said second converting mechanism comprising a link member having a front end operatively connected to said rearward transmission means, and a substantially vertically extending support shaft disposed between said rear wheels and supporting a central part of said link member such that said link member turns in a substantially horizontal plane about said support shaft; and

said rear wheel steering mechanism comprises a pair of rear tie rods having inner ends thereof connected to a rear end of said link member, respectively.

4,505,492

REAR SUSPENSION SYSTEM FOR MOTORCYCLES

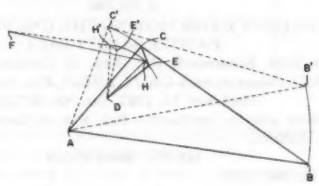
Kazuhiko Tsunoda, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

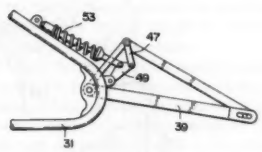
Filed Jul. 14, 1982, Ser. No. 398,263

Claims priority, application Japan, Jul. 13, 1981, 56-109833

Int. Cl.³ B62K *25/26*

U.S. Cl. 280—284 **2 Claims**





1. A rear suspension system for a motorcycle, comprising:

a rear wheel supporting member having a truss structure including a front corner portion pivotally supported on a motorcycle body frame, a rear corner portion having a rear wheel supported thereon, and a top corner portion;

first and second link members;

said first link member having a first end thereof pivotally supported on said top corner portion of said truss structure and a second end thereof connected to said second link member;

said second link member having a first end thereof connected to said second end of said first link member and a second end thereof pivotally supported on said body frame;

said first and second link members being disposed within an area defined by said truss structure of said rear wheel supporting member in side elevation;

a shock absorber having one end thereof pivotally supported on said body frame and the other end thereof connected to one of said first and second link members;

said second end of said second link member being located rearwardly of a straight line passing through said front corner portion and said top corner portion;

said rear wheel supporting member including a relatively wide base frame member which interconnects said front and rear corner portions, and relatively less wide front and rear subframe members which connect said front and rear corner portions to said top corner portion, respectively;

said front subframe member being shorter in length than said rear subframe member;

said second link member comprising a substantially triangular plate member; and

said plate member being pivotally connected at a first angle portion defining said first end thereof to said first link member, at a second angle portion defining said second end thereof to said body frame, and at a third angle portion thereof to said shock absorber.

4,505,493

SLALOM SKI BINDING

Jack G. Gustavsson, Katrineholm, Sweden, assignor to Aktiebolaget S K F, Gothenburg, Sweden

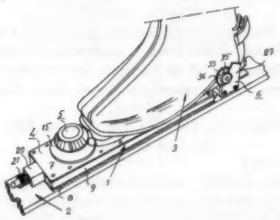
PCT No. PCT/SE79/00116, § 371 Date Feb. 19, 1980, § 102(e) Date Jan. 30, 1980, PCT Pub. No. WO80/00063, PCT Pub. Date Jan. 24, 1980

Continuation-in-part of Ser. No. 189,922, Jan. 30, 1980, abandoned. This PCT application May 22, 1979, Ser. No. 271,801

Claims priority, application Sweden, Jun. 19, 1978, 7807010; Jun. 10, 1980, 8004325; Jun. 10, 1980, 8004326; Apr. 16, 1981, 8102476

Int. Cl.³ N63C *9/08*

U.S. Cl. 280—617 **15 Claims**



1. Safety binding for downhill skiing comprising a toe connection means and a heel connection means for cooperation with corresponding parts of a ski boot, a base plate (4) adapted for attachment to longitudinally spaced locations of a downhill ski, said toe connection means comprising a single biconic roller member (5) having a lower support web portion (16) and from the said web portion an upwardly diverging annular surface portion (17) for engagement by a boot toe, which member (5) is movable in the longitudinal direction of the ski, and biasing means urging said member (5) toward said heel

connection means, at least one of said toe and heel connection means provided on said base plate.

4,505,494

RELEASE TYPE SKI BINDING

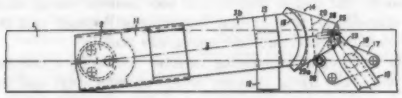
Ulrich Gertsch, Interlaken, Switzerland, assignor to TMC Corporation, Baar, Switzerland

Filed Dec. 22, 1981, Ser. No. 333,531

Claims priority, application Switzerland, Dec. 30, 1980, 9635/80; Oct. 19, 1981, 6650/81; Dec. 18, 1981, 8049/81

Int. Cl.³ A63C *9/085*

U.S. Cl. 280—618 **15 Claims**



1. A ski binding adapted to releasably hold a ski boot on a ski, comprising a toe holder which includes a lateral release mechanism having a release member supported for movement generally transversely of the ski and resilient means for yieldably resisting transverse movement of said release member in either direction away from an initial position in which said release member is substantially centered above the ski; a toe retainer which is adapted to engage a toe portion of the sole of the ski boot and is supported on said release member for pivotal movement relative thereto about a vertical first axis; a foot plate coupled to said toe retainer in a manner preventing relative movement of said foot plate and toe retainer in horizontal directions, said foot plate extending under and supporting the toe portion of the ski boot when said toe retainer is engaged therewith; first means for preventing movement of said toe retainer and said foot plate in a forward direction approximately toward the tip of the ski relative to said release member until said release member has moved a predetermined distance in a transverse direction away from said initial position thereof; and second means for facilitating substantially rectilinear movement of said toe retainer and said foot plate in a forward direction approximately toward the tip of the ski relative to said release member when said release member has moved transversely said predetermined distance from said initial position thereof.

4,505,495

PORTABLE, FOLDABLE AND CONVERTIBLE LUGGAGE TROLLEY

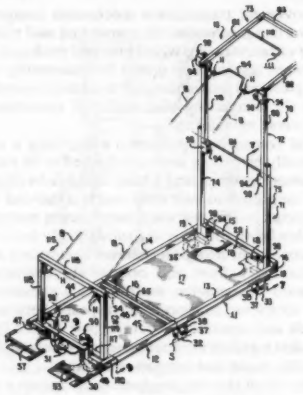
Janet M. P. Foss, Naish Hillhouse, Reybridge, Lacock, Chippenham, Wilts; John Foss, Chippenham; Christopher G. Brooks, Melksham, all of England, and Myron H. Ridgely, Waynesboro, Pa., assignors to Janet Mary Penrose Foss, England

Filed Dec. 14, 1982, Ser. No. 449,824

Int. Cl.³ B62B *3/02*

U.S. Cl. 280—651 **25 Claims**

1. A portable, foldable and convertible luggage trolley comprising at least first and second base supports adapted to be disposed in a generally common horizontal plane in side-by-side relationship in a first position of use and being movable to a second position at which the first and second base supports are generally in overlying/underlying relationship to each other with said second base support above said first base support, first pivot means contiguous adjacent sides of said first and second of base supports for effecting pivotal movement thereof between said first and second positions, first and second wheel means carried by said respective first and second base supports for collectively supporting said trolley when said first and second base supports are in said first position, said second wheel means being inoperative in said second position of use at which said first wheel means are operative for supporting said trolley, a handle adapted to be disposed normal to said base supports in both said first and second positions and also in nested generally coplanar relationship to said first base support in said second position, second pivot means contiguous a side of said first base support remote from said first pivot means for effecting pivotal movement of said handle between said normal and nested positions thereof whereby said trolley can be converted between at least two use positions in which said handle is normal to the base supports in both the first and



second positions thereof and a nonuse position in which said hanle is in nested generally coplanar relationship to said first base support in said second position, a luggage restraining member adapted to be disposed normal to said first and second supports in said first position and also in nested generally coplanar relationship to said second base support in said second position and third pivot means contiguous a side of said second base support remote from said first pivot means for effecting pivotal movement of said luggage restraining member between said normal and nested positions thereof.

4,505,496

DRIVE DEVICE FOR MOVING THE END FITTING OF A PASSIVE SAFETY BELT

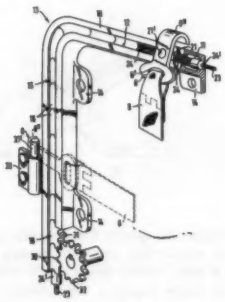
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,074

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1981, 3136335

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **16 Claims**



1. Drive device for moving an end fitting of a passive safety

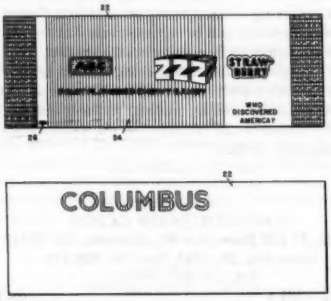
belt along a predetermined motion track which has track sections extending at an angle to each other comprising a flexible pulling and pushing means coupled to the end fitting to be moved, and a drive for driving the flexible pulling and pushing means, the combination therewith of a guide extending along the motion track in which the pulling and pushing means are guided with radial play relative to the pushing and pulling means axis, said pushing and pulling means in said guide having links which can move relative to one another, and are arranged with axial spacing in a fixed relationship to one another, the links being sleeve-like in form and the sleeve-like links are loosely linked up on a flexible cable, and wherein each link has on opposite ends support elements with each support element disposed in engagement with a support element of an adjoining link in an articulated manner with a space between the link end faces of adjoining links to allow relative movement between the support elements on adjacent links when negotiating curves, at least one of the lined-up links having a protruding output post, the link having the output post is arranged between two equalization springs.

4,505,497

MULTI-COLORED WRAPPER LABEL WITH READABLE DATA ON BOTH SIDES

Abe Katzman, 40 Carthage Rd., Scarsdale, N.Y. 10583

Division of Ser. No. 280,337, Jul. 6, 1981, abandoned. This application Sep. 7, 1983, Ser. No. 529,946
Int. Cl.³ B42D *15/00*
U.S. Cl. 283—81 **14 Claims**



1. A label comprising a multi-colored print adhered to one side of a transparent medium, the print including

(a) a first color layer covering an area of the one side of the medium except for unprinted subareas, the subareas forming first readable data which is conventionally readable when viewed from the opposite side of the medium and providing an unintelligible mirror image of such data if viewed from the one side of the medium,

(b) a second color layer, the second color layer being darker than the first color layer and covering at least a portion of the first color layer, which portion includes the unprinted subareas, the second color layer being visible as the first readable data through the subareas when viewed from the opposite side of the medium and concealing the mirror image of the first readable data when viewed from the one side of the medium, and

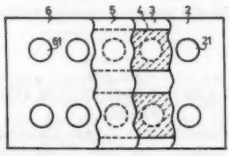
(c) means forming second readable data which is conventionally readable when viewed from the one side of the medium so that the transparent medium has conventionally readable data viewable from each side of the medium, and wherein the first readable data is correlated with the second readable data.

4,505,498

OPTICALLY-READABLE CARDS

Zvi Weinberger, Jerusalem, Israel, assignor to Teletoken Ltd., Holon, Israel

Filed Sep. 15, 1982, Ser. No. 418,582
Claims priority, application Israel, Aug. 2, 1982, 66445
Int. Cl.³ B42D *15/00*
U.S. Cl. 283—91 **11 Claims**



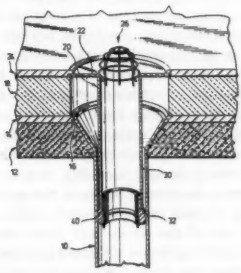
1. An optically-readable value card for use in a vending system for vending goods or services, characterized in that said card includes one or more heat-sensitive optically-readable value elements each of which, upon heating to a first temperature above ambient, changes an optically-discernable characteristic thereof in a reversible maner so that upon return to ambient temperature the value element returns to its initial condition, to permit checking the validity of the value element, but upon heating to a second temperature above ambient and higher than said first temperature, the value element changes its said optically-discernable characteristic in an irreversible manner to signify the cancellation thereof.

4,505,499

ROOF DRAIN INSERT COUPLING

Malcolm S. Uglow, 78 Bloomington Cresc., Downsview, Ont., Canada (M3N 1B1), and Phillip J. Uglow, 72 Gihon Spring Dr., Rexdale, Ont., Canada M9V 4X9

Filed May 2, 1983, Ser. No. 490,398
Claims priority, application Canada, Apr. 15, 1983, 425977
Int. Cl.³ E04B *5/48*
U.S. Cl. 285—42 **20 Claims**



15. A pipe coupling device to couple one end of a small diameter cylindrical pipe, slidable within a larger diameter cylindrical pipe, coaxially within the larger pipe, said coupling device comprising

a substantially cylindrically shaped member comprising compressible, elastomeric material,

said cylindrically shaped member when uncompressed being coaxially slidable within the larger pipe and on compression thereof by axially directed compressive forces expanding radially outwardly sufficiently to sealably engage with interior surfaces of said larger pipe,

a portion of the cylindrically shaped member being adapted when uncompressed to engage said end of the small pipe

and on compression of the cylindrically shaped member by axially directing compressive forces to form a seal with said small pipe,

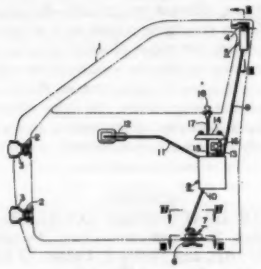
means to apply axially directed compressive forces to said cylindrically shaped member actuatable by activating means which, when the cylindrically shaped member is axially disposed within the large pipe with said portion of the cylindrically shaped member engaging said small pipe, said activating means lying radially inside of the small pipe and accessible for actuation through said small pipe.

4,505,500

DOOR LOCK ARRANGEMENT FOR AUTOMOTIVE VEHICLE

Shunji Utsumi, Yokosuka, and Takayo Chikaraishi, Kawasaki, both of Japan, assignors to Nissan Motor Company, Limited and Ohi Seisakusho Co., Ltd., both of, Japan

Filed Sep. 14, 1982, Ser. No. 417,832
Claims priority, application Japan, Sep. 22, 1981, 56-149701
Int. Cl.³ E05C *3/16, 9/16*
U.S. Cl. 292—48 **8 Claims**



1. An apparatus for operating door locks of a vehicle, comprising:

an upper door lock mounted in an upper portion of a door and adapted to be engageable with an upper striker which is secured to an upper portion of a body of the vehicle;

a lower door lock mounted in a lower portion of the door and adapted to be engageable with a lower striker which is secured to a lower portion of the vehicle body;

an inside door handle, an outside door handle, a key operable lock cylinder and a locking knob, mounted on said door;

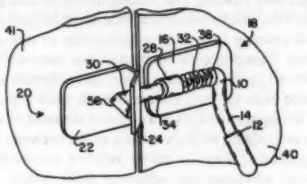
a central operation assembly located in said door, said central operation assembly including a base plate, first and second connecting levers pivotably mounted for rotational movement in synchronism in the same direction about an axis on said base plate and connected, respectively, with one of the upper and lower door locks, a release lever and a sublever on said base plate providing with said connecting levers an operative connection between said inside door handle and said outside door handle and said door locks, such that manipulating one of said inside door handle and said outside door handle in an unlatching direction rotates said connecting levers in synchronism and releases the upper door lock and the lower door lock, a locking lever mounted on said base plate and operatively connected with said sublever and said key operable lock cylinder and said locking knob such that operating one of the lock cylinder and the knob in a locking direction establishes a locked position of said locking lever and cancels the operative connection provided by said release lever and sublever and connecting levers between the inside and outside handles and the upper and lower door locks.

4,505,501

LATCHING DEVICE

Daniel G. Fuchs, Quincy, and Larry R. Rudd, Payson, both of Ill., assignors to The Knapheide Mfg. Co., Quincy, Ill.

Filed Aug. 30, 1983, Ser. No. 527,921
Int. Cl.³ E05C *5/02*
U.S. Cl. 292—62 **13 Claims**



1. In a latching device for attaching first and second main members together, said latching device including a latch rod assembly attached to said first main member and a receiving member attached to said second main member, said latch rod assembly including a latch rod which is rotatably and slidably attached to the first main member and spring means for biasing said latch rod in a direction away from said receiving member, said latch rod including an engaging and which engages said receiving member when said latching device is latched, said receiving member including a first flange which projects away from said second main member; the improvement comprising:

said engaging end having first and second engaging surfaces which abut first and second receiving surfaces of the receiving member when the latching device is latched,

said first receiving surface being on said first flange of said receiving member and being relatively flat,

said first engaging surface being relatively flat,

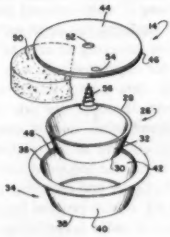
said first engaging surface being designed and arranged such that it forms an acute angle with a line perpendicular to the axis of rotation of the latched rod and connecting the axis of rotation of the latch rod to the center point of the first engaging surface.

4,505,502

MAGNETIC DOOR CATCH

Rioe Tomita, 47-126 Kaimalolo Pl., Kaneohe, Hi. 96744

Filed Jun. 28, 1983, Ser. No. 508,513
Int. Cl.³ E05C *19/16*
U.S. Cl. 292—251.5 **24 Claims**



1. Catch apparatus comprising a first member having magnetic means mounted thereon and a second member having a magnetically attractable means mounted thereon, one of said magnetic means and magnetically attractable means being mounted on its respective member for rotary motion in every direction, wherein one of said first and second members comprises a cup-shaped housing having an open end and the means mounted thereon comprises a cup-shaped element positioned within the housing and having an end formed of the means,

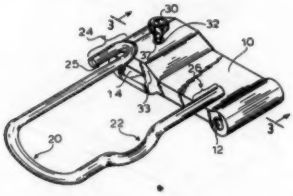
which is exposed through the open end of the housing, the cup-shaped element having curved side walls which are complementary to curved side walls of the housing thereby permitting relative rotary movement in every direction between the cup-shaped element and the housing.

4,505,503

LOCKING FASTENER

Robert R. LaMontagne, Liverpool, N.Y., assignor to Fargo Mfg. Company, Inc., Poughkeepsie, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,610
Int. Cl.³ B65D *33/34*
U.S. Cl. 292—315 **4 Claims**



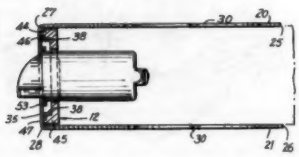
1. A fastening device, which comprises:
a rigid locking member terminating in a first end portion and a second end portion with said portions being maintained at a predetermined distance from each other;
a clamp body having a first opening adapted to slidably receiving the first end portion of the locking member and a second opening adapted to slidably receiving the second end portion of the locking member;
a U-shaped channel comprising at least one of either said first or second end portions of the locking member;
a locking means comprising a threaded locking screw threadable in a threaded bore disposed within at least one of either the first or second openings in the clamp body so that a tightening down of the screw in the bore causes the screw to engage and secure the channel in the clamp body, and said threaded locking screw includes a weakened section that will shear when a predetermined closing force is applied to the threaded locking screw as it is being tightened down so as to render the device relatively tamperproof.

4,505,504

DOOR LOCK COVER

Harry Matzkin, 34 Interlaken Dr., Eastchester, N.Y. 10709, and Leslie Getto, 416 E. 174th St., Bronx, N.Y. 10457

Filed Dec. 23, 1983, Ser. No. 564,715
Int. Cl.³ E05C *1/16*
U.S. Cl. 292—337 **4 Claims**



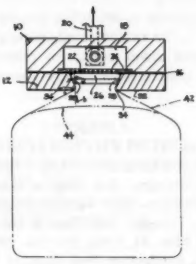
1. In a door lock cover for covering the edge and adjacent portions of a door to overlie a lock recessed within said door, the cover including a housing having opposed side walls and an interconnecting web, said web overlying an edge surface of said door, said web having a medially disposed opening therein for the location of an end plate surrounding a latch member of said lock, the improvement comprising: said opening being of rectangular configuration and bounded at the ends thereof by free edges, the longer side edges thereof being formed by integral inwardly bent flanges extending inwardly of said web to points beyond the inner surface thereof; a plate element of elongated planar configuration and having longitudinal edge flanges on either side extending laterally from the plane of said plate element; said flanges on said web-forming channels, said flanges on said plate element being engaged within said channels to position said plate element relative to said web to underlie said opening in said web; and means for anchoring said plate element against longitudinal movement relative to said web.

4,505,505

VACUUM DEVICE FOR LIFTING AN ARTICLE LOOSELY WRAPPED IN FLEXIBLE FILM

Gane W. Senaratne, Rancho Palos Verdes, Calif., assignor to Airtec Industries, Long Beach, Calif.

Filed Jul. 13, 1983, Ser. No. 513,177
Int. Cl.³ B66C *1/02*
U.S. Cl. 294—64.1 **12 Claims**



1. A vacuum device for lifting an article loosely wrapped in flexible film comprising:
(a) a body;
(b) a vacuum chamber within said body for drawing the film within the chamber and for retaining the film and included article in suspension by a vacuum source;
(c) said chamber having an anterior end wall, opposing sidewalls, vacuum communication means comprising ports in the anterior end wall for communication of the chamber with the vacuum source, and an opening opposite the anterior end wall for receiving the film within the chamber;
(d) said ported anterior end wall and opposing sidewalls structured and positioned to have sealing contact with the film for substantially sealing the vacuum communication means when the film is drawn into the chamber by the vacuum source, and said anterior end wall being structured to support the film in suspension when the film and included article are retained in suspension by the vacuum source; and
(e) said opposing sidewalls being positioned to interrupt a lineal path of the suspended film to cause the weight of the suspended article to maintain the contact of the film with the sidewalls when the film and included article are retained in suspension whereby the weight of the suspended article assists in maintaining the vacuum seal within the chamber.

4,505,506

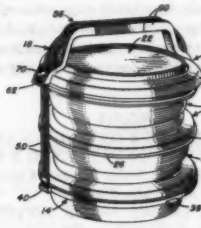
ADJUSTABLE CARRIER FOR CONTAINERS

Augusto A. Picozza, Johnston, R.I., assignor to Dart Industries Inc., Northbrook, Ill.

Filed May 11, 1983, Ser. No. 493,477
Int. Cl.³ B65D *61/00*
U.S. Cl. 294—161 **15 Claims**

1. A carrier for containers, said carrier comprising a lower

collar, an upper collar, and flexible, elongated strap means therebetween having closely spaced ratchet teeth formed along the length thereof, said strap means having upper and lower ends, strap retaining means on said lower collar for



receiving and retaining the lower end of said strap means, strap retaining means on said upper collar having means for engaging and locking to the ratchet teeth of said strap means, and lock means on said lower collar for releasably locking said lower collar to a container receivable therein.

4,505,507

CARRIAGE WITH ADVANTAGEOUS FLOW CHARACTERISTICS FOR VEHICLES

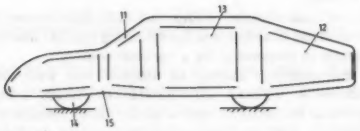
Hubert Ludwig, Göttingen, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Mar. 31, 1983, Ser. No. 480,710

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 3212000

Int. Cl.³ B62D *35/00*

U.S. Cl. 296—1 S **8 Claims**



1. A vehicle body particularly for automobiles with advantageous flow characteristics comprising: a passenger compartment having a substantially rectangular cross-section and at least one sloping windshield, said body having a cross-section with width varying in relation to change in height along longitudinal axis of said body at predetermined sections adjacent the passenger compartment, so that only a substantially small flow occurs across an upper longitudinal edge of said body with substantially negligible separation.

4,505,508

TRUCK BED LINER

Mark S. Carter, 16792 Talisman La., Apt. 319, Huntington Beach, Calif. 92649, and Jim Ritter, 5241 E. Willow St., Long Beach, Calif. 90815

Filed Mar. 15, 1983, Ser. No. 475,600

Int. Cl.³ B62D *33/02*

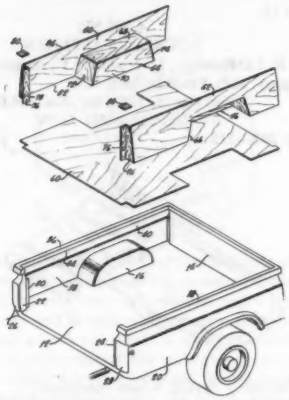
U.S. Cl. 296—39 R **13 Claims**

1. For use with a pickup truck body having a floor, upstanding sidewalls, and wheel wells, an improved truck body protective assembly comprising

a side panel liner sheet extending along one of said sidewalls and having a notch fitting over one of said wheel wells, and

means adapted to be fixedly secured to said one wheel well for pressing an intermediate area of said liner sheet toward said one sidewall,

said one sidewall of the truck body including an inwardly extending shoulder at an upper portion thereof, said



liner sheet adapted to be captured between said shoulder and said floor, said liner sheet having a lower edge adjacent said floor and being bowed outwardly by said means for pressing an intermediate area of said liner sheet.

4,505,509

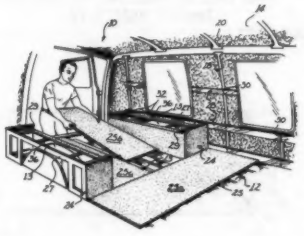
REMOVABLE VAN BENCH

Albert R. Simeri, and Paul S. Simeri, both of Elkhart, Ind., assignors to Van Express, Inc., Elkhart, Ind.

Filed Jun. 8, 1983, Ser. No. 502,327

Int. Cl.³ B60P *3/32*

U.S. Cl. 296—63 **2 Claims**



1. In a van including a floor, a covering for said floor, outer side walls, vertical rib means for providing rigid support for the side walls, an inner wall applied over said side walls and said rib means, a seat assembly, the improvement comprising a horizontal belt rail secured to said rib means and located between said side walls and inner walls, and a seat support mounted to said floor and secured to said belt rail, said seat assembly carried upon said seat support.

4,505,510
INSTRUMENT AND CONTROL PANEL FOR AUTOMOTIVE AGRICULTURAL MACHINE

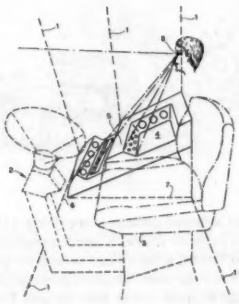
Louis Lepoix, Baden-Baden, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Zweigniederlassung Fahr, Gottmadingen, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 967,003

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755622

Int. Cl.³ B60K *37/00*

U.S. Cl. 296—70 **10 Claims**



1. An instrument and control panel for controlling and monitoring the functions of an automotive agricultural vehicle adapted to travel in a normal forward travel direction and having a forwardly facing driver's seat, said panel being mainly to the side of said seat relative to said direction and comprising:

an upper wall inclined to the horizontal laterally adjacent said seat and extending upwardly back in said travel direction from a front edge well below the forward field of view of a driver in said seat, said upper wall being formed with at least two recesses each having a front side, a base, and a back side; and

instrument and control devices mounted at least on said front sides and within reach of the driver in said seat.

4,505,511
GASKET FOR WINDOW PANE

Edgar Hänle, Wettstetten; Joachim Wunderlich; Johann Zwickl, both of Ingolstadt, and Stefan Haerdl, Gaimersheim, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union AG., Ingolstadt, Fed. Rep. of Germany

Filed Jun. 21, 1983, Ser. No. 506,326

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1982, 3223155

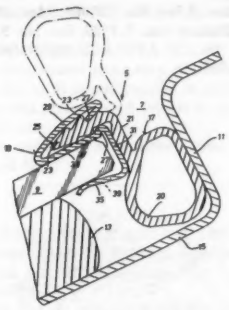
Int. Cl.³ B60J *1/02*

U.S. Cl. 296—93 **18 Claims**

1. A gasket for use in an automotive vehicle body having a window opening defined by an attachment flange inwardly offset from an outer surface of the body by a wall portion and extending substantially parallel to the body surface, a window pane secured to the attachment flange and providing a gap of predetermined width between the edge of the window pane and the wall portion, the gasket comprising:

a first elongated portion adapted to be affixed to a marginal portion of the window pane,

a second elongated portion being transversally elastic and movable relative to the first elongated portion between a first position in which the second elongated portion is seated substantially entirely within the gap between the edge of the window pane and the wall portion and a



second position in which it is out of the gap, whereby the gap is rendered accessible.

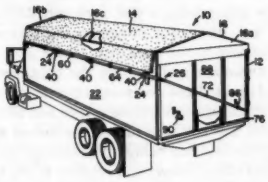
4,505,512
ROLL-UP TARP APPARATUS

Steven C. Schmeichel, and Charles M. Schmeichel, both of Hwy. 20, Jamestown, N. Dak. 58401

Filed Dec. 6, 1982, Ser. No. 447,291

Int. Cl.³ B60P *7/02*

U.S. Cl. 296—98 **14 Claims**



1. A roll-up tarp apparatus for an open truck box or the like comprising:

(a) a tarp made of a flexible material, said tarp having a length approximate that of the length of the truck box, said tarp further having a width somewhat greater than the width of the truck box;

(b) means for fixedly securing a first side edge of said tarp to a first longitudinal side of the truck box;

(c) an elongated roll-bar member attached to a second side edge of said tarp by a plurality of elongated, flexible strap members, said elongated roll-bar member being displaced from said second side edge of said tarp;

(d) crank means interconnected to said elongated roll-bar member for rolling said elongated roll-bar member transversely of the open truck box so as to cover the truck box with said tarp or uncover the truck box, said crank means including an elongated crank handle interconnected to said elongated roll-bar member and further including retaining bracket means positioned proximate an end of the truck box for retaining the crank handle when said tarp is in a covered position; and

(e) a plurality of spaced hook members displaced downwardly from the top edge of a second longitudinal side of the truck box and adapted for receipt of said elongated roll-bar member, said hook members cooperating with said crank means for retaining said elongated roll-bar member when said tarp is in a covered position.

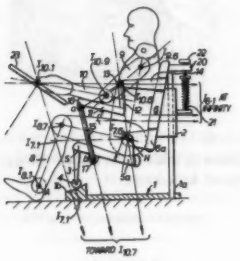
4,505,513
SUSPENSION SEATS FOR VEHICLES

Geoffrey W. Barley, Brookfield, Wis., assignor to UOP Inc., Des Plaines, Ill.

Continuation of Ser. No. 129,506, Mar. 11, 1980,. This application Jan. 7, 1983, Ser. No. 524,166

Int. Cl.³ A47C 3/00; B60N 1/02

U.S. Cl. 297—307 3 Claims



1. A vehicle seat adapted to receive an occupant of a predetermined size comprising a seat part, which includes a back rest, a seat rest, means for mounting the seat rest for tilting movement relative to the back rest, a base part, and a suspension means mounting and guiding the back rest for substantially vertical upward and downward movement relative to the base part in a ride zone extending above and below a mid-ride position of the seat rest, the suspension means and the means for mounting the seat rest being operable together to guide the seat rest in said tilting movement relative to the back rest such that at the mid-ride position of the seat there is no relative movement, as the seat rest moves above and below its mid-ride position, between the thighs of an occupant for whom the seat is designed and the seat rest, nor between the back of an occupant and the back rest and such that the occupant's ankles remain fixed at a predetermined point relative to the base part, the suspension means comprising a spring for counter-balancing the seat part and seat occupant; an armrest on at least one side of the seat, and means mounting fore and aft portions of the armrest for tilting movement relative to the seat rest and the back rest and locating the armrest so as to support, without relative movement, the lower arm of the occupant when the occupant is the vehicle driver so that the driver's hand will remain fixed at a predetermined point relative to the base part when the driver is grasping a steering wheel or other control, said last named mounting means constraining the said fore and aft portions of the armrest to pivotally move about a pair of horizontal transverse axes, one of said pair of axes being the instantaneous center of rotation of the occupant's lower arm and the armrest about a first part of the seat which moves pivotally with respect to the armrest during said upward and downward movement, the other of said pair of axes being located in such a manner that its intantaneous direction of motion is the same as if the said transverse axis moves in an arc about the instantaneous center of rotation of the driver's lower arm and the armrest relative to a second part of the seat which moves pivotally with respect to the armrest during said upward and downward movement.

4,505,514
CHAIR FOR DENTAL PATIENTS

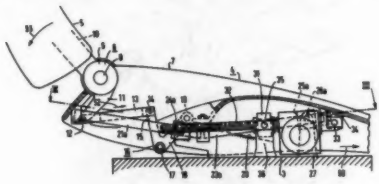
Klaus Stöckl, and Reinhard Engert, both of Heppenheim, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 470,003

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1982, 3209773

Int. Cl.³ A61G 15/00

U.S. Cl. 297—322 17 Claims



1. In a chair for a dental patient comprising a chair substructure containing a support frame, a superstructure containing a seat having a seat frame, a back rest, means for pivotally hinging the back rest to the seat, displacement means being disposed between the support frame and the seat frame including a straight line mechanism for shifting the seat frame between a first position with the seat being substantially level and a second position with the seat moved the maximum amount from the first position, control means for controlling the inclination of the back rest as the seat moves between the first position and second position, said control means holding the back rest in an upright position when the seat is in the first position and tilting the back rest as the seat moves toward the second position, and means for tilting the seat as it moves from the first position toward the second position, the improvements comprising the means for pivotally hinging the back rest to the seat including a pivotal bearing having a first pivot axis approximately in the area of the hip joint of a person sitting in the chair, said pivotal bearing including a bearing part rigidly connected to the back rest, said control means comprising a first lever arm mounted for pivotal movement on a second pivot axis on the seat frame, a second lever arm mounted for pivotal movement on said second pivot axis and rigidly connected to move with the first arm, a projection on the bearing part of the back rest extending into the seat adjacent the seat frame, and a tie rod connecting an end of said projection to the first arm, said second arm having a roller riding on a track disposed on the support frame so that the second and first arms pivot around their connection as the seat frame moves from the first position toward the second position to allow the back rest to pivot on the first pivot axis.

4,505,515
HINGE, PARTICULARLY FOR SEAT WITH ADJUSTABLE BACK REST

Hans Wilking, Rotselberg; Kurt Heinrich, Rockenhausen, and Walter Peetz, Hackenheim, all of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG, Remscheid-Hasten, Fed. Rep. of Germany

Filed Jul. 28, 1982, Ser. No. 402,818

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130313

Int. Cl.³ A47C 1/025

U.S. Cl. 297—362 10 Claims

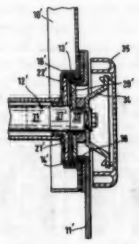
1. A hinge, particularly, for a seat having a seat part and an adjustable back part, comprising

two hinge members pivotally connected with one another;

an axle pivotally connecting said hinge members with one another; and

adjusting and fixing means determining a relative position of

said hinge members and formed as a transmission including an internal gear and a spur gear engaging with one another and an eccentric provided on said axle, said internal gear and said spur gear being formed as toothed cup-shaped members connected with said hinge members for joint rotation therewith, and the cup-shaped member which forms said spur gear having an outer surface provided with outer teeth, whereas the cup-shaped member



which forms said internal gear has an inner surface provided with inner teeth meshing with said outer teeth of said cup-shaped member which forms said spur gear, so as to transmit torque, and said cup-shaped members being formed as thin-walled metal sheet pressed cup-shaped members with said surfaces having a predetermined axial length and said teeth extending substantially over the entire axial length of said surfaces.

4,505,516

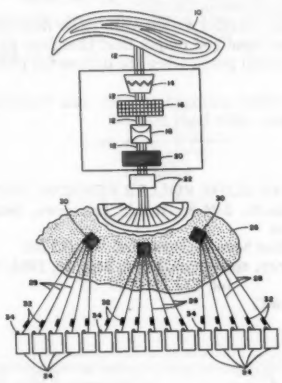
HYDROCARBON FUEL RECOVERY

Robert H. Shelton, 5045 Royal La., Dallas, Tex. 75229

Continuation of Ser. No. 170,475, Jul. 21, 1980, abandoned. This application Sep. 20, 1983, Ser. No. 497,028

Int. Cl.³ E21C *41/10*; C10B *53/06*

U.S. Cl. 299—2 **13 Claims**



1. A system for extraction of a hydrocarbon fuel from a hydrocarbon fuel-bearing ore comprising:

a. means for mining the ore,

b. a plurality of separately and individually portative retorts for processing said ore to produce a hydrocarbon fuel,

c. means for selectively and separately transporting said mined ore to each of said retorts,

d. means coupled to said transport means for selectively and separately regulating the amount of ore transported to a respective retort, and

e. at least one storage device coupled to said retorts for collecting and storing said hydrocarbon fuel.

11. A method of extracting oil from oil-bearing shale comprising the steps of:

(a) forming an underground chamber in a vein of oil-bearing shale,

(b) mining the shale in said vein,

(c) conveying said mined shale to a plurality of portative retorts of a size to fit in and located in said chamber,

(d) processing said shale in said retorts to produce an oil-bearing fluid, and

(e) moving the retorts in consonance with movement of mining of said shale.

4,505,517

SELF-ADVANCING MINE ROOF SUPPORTS

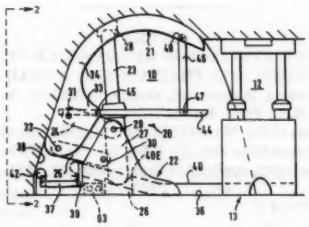
James Seddon, Heskin, and Frank Jones, Ashton-in-Makerfield, both of England, assignors to Dobson Park Industries PLC, Nottingham, England

Filed Oct. 22, 1982, Ser. No. 436,126

Claims priority, application United Kingdom, Oct. 23, 1981, 8131970

Int. Cl.³ E21D *23/00*

U.S. Cl. 299—31 **20 Claims**



1. A self-advancing mine-roof-support for use aligned with a main roadway or gate, said support having a floor-engaging part and a roof-engaging part spaced apart by extensible load-bearing prop means, and conveyor location means for constraining the relative positions of two transversely acting conveyors to facilitate discharge of mineral from one of the conveyors to the other, the roof-engaging part extending from the prop means laterally of the direction of the roadway or gate, which direction corresponds to the direction of action of means for advancing the support.

4,505,518

MINERAL WINNING MACHINES

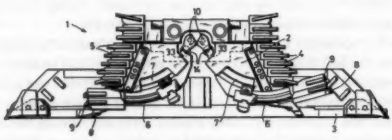
Alois Hauschopp, Werne, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,757

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1982, 3225181

Int. Cl.³ E21C *27/32*

U.S. Cl. 299—34 **8 Claims**



1. In a mineral winning machine having a body (2) equipped with cutters, some of which (8, 9) are mounted on adjustable

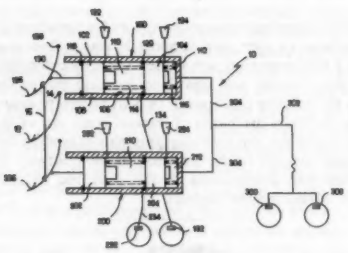
carriers (6); an improved arrangement for adjusting the position of said carriers, said arrangement comprising: an eccentric stop member (10) with a plurality of working faces (14, 15, 16) selectively engageable with an associated adjustable carrier to define set positions of the carrier relative to the body, a shaft (11) rotationally supported on said body and carrying the stop member, a coupling piece (18) provided with a manually-operable handle (19), locking means in the form of complementary interengageable projections (28) and recesses (30) operably disposed between the coupling piece and a fixed structure (29) for locking the coupling piece in set rotational positions corresponding to the working faces of the stop member, connecting means (13, 27) disposed between the shaft and the coupling piece for permitting the shaft and coupling piece to move relative to one another axially of the shaft to release the locking means while maintaining the shaft rotationally locked to the coupling piece for rotation with the handle, and a spring (24) for biasing the coupling piece to cause the locking means to lock the coupling piece to the fixed structure in one of said set positions; the coupling piece being axially displaceable relative to the shaft with the aid of the handle against the force of the spring to disengage the locking means and permit rotation of the shaft through the coupling piece and connecting means to permit partial rotation of the stop member and re-setting of the carrier.

4,505,519

BRAKING SYSTEM FOR AUTOMOBILE VEHICLE FORMED BY A TRACTOR AND A TRAILER

Roland Muterel, Bessancourt, France, assignor to Societe Anonyme D.B.A., Paris, France

Continuation of Ser. No. 338,802, Jan. 11, 1981, abandoned. This application Jun. 28, 1984, Ser. No. 625,196
Claims priority, application France, Jan. 30, 1981, 81 01834
Int. Cl.³ B60T *11/20*
U.S. Cl. 303—6 A **8 Claims**



1. A braking system for an automotive vehicle formed of a tractor and a trailer, which comprises:

a pair of tractor brakes associated respectively to paired left and right wheels of the tractor;

at least a pair of trailer brakes associated respectively to pair left and right wheels of the trailer;

first and second tandem master cylinders each including first and second pressure chambers separated one from the other by a piston, said master cylinders being manually operable independently or simultaneously;

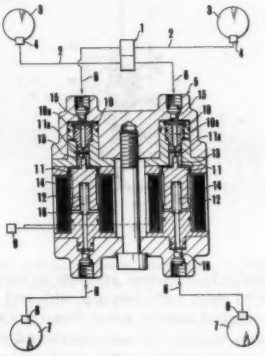
said first master cylinder having its first chamber connected to the left tractor brake of said pair of tractor brakes, said second master cylinder having its first chamber connected to the right tractor brake of said pair of tractor brakes, said second chambers of said master cylinders being directly and permanently connected jointly to one another and both trailer brakes of said pair of trailer brakes, thereby ensuring pressure balance between the left and right tractor brakes when braking all wheels of the vehicle.

4,505,520

DEVICE FOR PREVENTING VEHICLE WHEELS FROM LOCKING

Toshifumi Maehara, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1983, Ser. No. 463,267
Claims priority, application Japan, Feb. 12, 1982, 57-20758
Int. Cl.³ B60T *8/04*
U.S. Cl. 303—119 **6 Claims**



1. A wheel-lock preventing device comprising:

an input fluid chamber communicating with a master cylinder;

an output fluid chamber communicating with rear wheel brake devices;

a differential piston disposed to separate the input and output fluid chambers from each other, said differential piston being arranged to move toward the output fluid chamber to a predetermined extent against the spring force of a return spring when the actions of fluid pressure from the two fluid chambers exceed a prescribed value, said return spring being arranged to return said differential piston to the original position thereof;

a valve body member arranged to close fluid passage between said input and output fluid chambers by engaging the differential piston when the differential piston moves; and

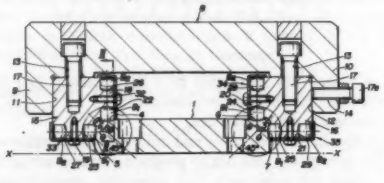
a driving device arranged to open said fluid passage by moving said valve body member.

4,505,521

LINEAR SLIDE ROLLER BEARING UNIT

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed May 24, 1984, Ser. No. 613,643
Claims priority, application Japan, May 26, 1983, 58-92014
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **4 Claims**



1. A linear slide roller bearing unit comprising:

a track shaft extending in the longitudinal direction of said linear slide roller bearing unit and having loaded roller

rolling surfaces respectively formed on both side surface portions of each of the right and left ridges thereof projecting in the direction of an imaginary oblique line intersecting the horizontal axis at an angle of about 45°;

a movable table constituted by a long block member disposed so as to straddle said track shaft, said movable table having longitudinal recesses respectively formed in the opposing inner surfaces of skirt portions thereof;

a pair of right and left bearing bodies each constituted by a long block member which is screwed to the corresponding recess in said movable table, each bearing body having a guide ridge projecting from the center of each inner side surface portion of said block member, each guide ridge having one side surface thereof defined as a loaded roller rolling surface confronting the corresponding loaded roller rolling surface of said track shaft and the other side surface defined as a non-loaded roller rolling surface;

barrel-shaped rollers adapted to be recirculated along said loaded roller rolling surfaces and non-loaded roller rolling surfaces of said bearing bodies and to come in contact with said loaded roller rolling surfaces on said track shaft when rolling along the loaded roller rolling surfaces on said bearing bodies; and

a roller retainer attached to each of said guide ridges so as to face the corresponding inner side surface portion of the associated bearing body and adapted to guide said rollers so that they can recirculate through the space defined between said roller retainer and inner side surface portion,

wherein said rollers in the state of serving as loaded rollers are brought into contact with said loaded roller rolling surfaces on said track shaft at a contact angle of about 45° with respect to an imaginary oblique line passing through the center of each of said right and left ridges of said track shaft so that said loaded rollers contacting said loaded roller rolling surfaces on both side surface portions of each ridge are orthogonal to each other.

4,505,522

INFINITE CIRCUIT USING ROLLING BEARINGS FOR PROVIDING RECTILINEAR MOTION

Kazuhiko Tanaka, Yokohama, Japan, assignor to Nippon Thomson Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,710

Claims priority, application Japan, Dec. 29, 1983, 58-245933

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **4 Claims**

1. An infinite circuit using rolling bearings for providing the rectilinear motion, comprising:

(a) rolling elements consisting of rollers or balls;

(b) rolling bearings, constituted by said rolling elements, for providing the infinite rectilinear motion by endlessly circulating said rolling elements in an infinite circuit while keeping the direct contact relation with each other;

(c) a rectilinear track passage in the region where a weight is applied thereto;

(d) a rectilinear return passage in the region where no weight is applied thereto; and

(e) two direction reversing passages, each of which passages consisting of two quarter-circular passages which are connected in series, said direction reversing passages respectively coupling both ends of said track passage and said return passage, thereby enabling the moving direction of said rolling elements to be smoothly reversed,

wherein the cross sections of said respective rolling elements at the axial central plane of said infinite circuit having the circular cross sections of the same diameter which are sequential in contact relation with each other, and assuming that a radius of curvature of the arc portion of the locus which is formed by the center of each rolling element which rolls in said direction reversing passage is R and that a diameter of said rolling element is D_a and that

$$R' = \frac{90}{\sin^{-1}\left(\frac{D_a}{2R}\right)}$$

(where, R′ indicates a value corresponding to the maximum number of said rolling elements which can be inserted in said two quarter-circular passages of the direction reversing passage on the basis of said radius R of curvature of said direction reversing passage), said R′ being set into a value near (integer+0.25).

4,505,523

PRESTRESSED ROLLING BEARING DEVICE

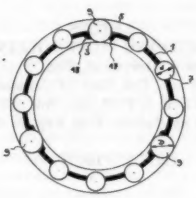
Gérard Stephan, Croissy, France, assignor to Nadella, Rueil Malmaison, France

Continuation of Ser. No. 256,124, Apr. 21, 1983, abandoned. This application Oct. 11, 1983, Ser. No. 540,496

Claims priority, application France, Apr. 21, 1980, 80 08863

Int. Cl.³ F16C *19/49, 19/56, 33/48*

U.S. Cl. 384—445 **10 Claims**



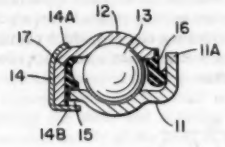
1. In a prestressed conventional roller or needle bearing device comprising an inner raceway, an outer raceway, a plurality of rolling elements interposed between the raceways, a cage for guiding and/or retaining the rolling elements, at least one of which rolling elements having an outside diameter larger than the outside diameter of the other rolling elements; the improvement wherein said rolling element of larger diameter comprises a ball whereas the other rolling elements are rollers or needles, the ball having in a free unstressed state thereof before assembly with the inner raceway and outer raceway a diameter larger than the radial distance between the inner raceway and the outer raceway in regions of the raceways engageable by the ball so as to be subjected to compressive stress therebetween, the rollers or needles having such diameter as to be devoid of compressive stress between the inner raceway and the outer raceway, and said regions of the raceways engageable by the ball also being engageable by said rollers in bearing operation.

4,505,524

THRUST BEARING AND METHOD OF MAKING SAME

Donald J. Krall, Hudson, Ohio, assignor to Kendale Industries, Inc., Valley View, Ohio

Filed Jul. 21, 1983, Ser. No. 515,589
Int. Cl.³ F16C *19/10*
U.S. Cl. 384—615 11 Claims



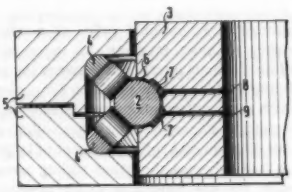
1. In a bearing unit comprised of a first race member and a second race member spaced apart in axial alignment with a plurality of ball bearings therebetween and in rolling engagement with the race members, the improvement of each of said race members having a flange extending substantially parallel to the axis of the bearing unit and accommodating the ball bearings between the flanges, and a cup-shaped annular keeper embracing the outermost of said race members, said annular keeper having a first end portion flanged and extending radially inward adjacent one end of the outermost of said race members to limit axial movement of the said outermost race member, said keeper member having a second end portion spaced in an axial direction from said first end portion, said second end portion extending radially inward adjacent an opposite end of the said outermost race member to embrace the outermost race member between the first end portion and the second end portion and the second end portion of said annular keeper, said second end portion of the keeper member being spaced from the peripheral outer edge portion of the innermost of said race members to provide clearance therebetween.

4,505,525

WIRE RACE BEARING WITH ROLLING CONTACT

Heinrich Wolzenburg, Dortmund, Fed. Rep. of Germany, assignor to Hoesch AG, Fed. Rep. of Germany

Filed Jun. 7, 1984, Ser. No. 618,210
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1983, 3320457
Int. Cl.³ F16C *27/04*
U.S. Cl. 384—565 4 Claims



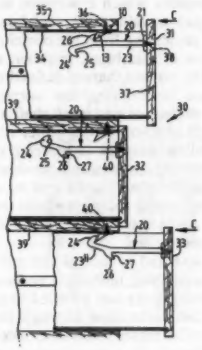
1. Wire race bearing with rolling contact, consisting of rolling elements, wire elements serving as raceways for the rolling elements, and an inner and outer bearing ring, one of which is designed as two-part, and with an insert fitted between at least one wire element and its associated wire bed in the bearing ring in question, and characterised by the fact that the insert is in the form of a tubular pressure pad (7).

4,505,526

DRAWER CATCHES

David G. Leck, 35 Park Rd., Westcliff-on-Sea, Essex, England

Filed Mar. 1, 1982, Ser. No. 353,592
Claims priority, application United Kingdom, Mar. 6, 1981, 8107046
Int. Cl.³ A47B *88/00*
U.S. Cl. 312—333 11 Claims



1. Catch means comprising a hooked element mountable on a part of a piece of furniture movable

relative to another part of the piece of furniture and which is, when so mounted, engageable with a single fixed stop body on the other part to prevent extended relative movement of the two parts, the hooked element comprising an elongate flexible member, one end of which is adapted for mounting on a part of a piece of furniture, a first hook portion formed on said elongate flexible member and at least one further hook portion formed on said elongate member spaced along the length thereof from said first hook portion, said first hook portion and the or each of said at least one further hook portions facing in the same axial direction and extending in radially different directions from the axis of the elongate member such that upon mounting said flexible member said hooks may be oriented about an axis corresponding to the axis of the elongate member to place a selected one of said hook portions in a cooperative position with regard to said stop body whereby relative movement of said two parts causes said selected one of said hook portions to engage said stop body to prevent relative movement of said two parts by an amount more than that determined by the selected hooked element.

4,505,527

LOW INSERTION FORCE CONNECTION ARRANGEMENT

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

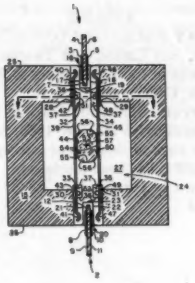
Filed Aug. 29, 1983, Ser. No. 527,638
Int. Cl.³ H01R *9/09*
U.S. Cl. 339—17 LM 17 Claims

1. In combination, a first printed wiring board and a second printed wiring board, each printed wiring board including at least one terminal, and a low insertion force arrangement for establishing a connection between said printed wiring boards, said arrangement comprising:

at least one connection spring, said spring including first and second contacts, first and second pivot points located between said first and second contacts, and an actuator engaging area, each of said contacts engageably positioned relative to a corresponding one of said terminals;

first and second fulcrums positioned to engage said spring at said first and said second pivot points; and

an actuator located proximate to said spring at said actuator engaging area, said actuator being positioned in a first actuator position relative to said spring to pivot said spring about said fulcrums, at said pivot points, to a first



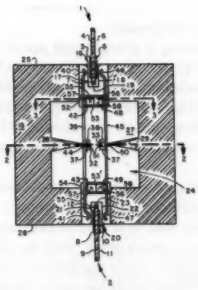
spring position and thereby cause said contacts to engage with said respective terminals, and said actuator further being positioned in a second actuator position relative to said spring to pivot said spring about said fulcrums, at said pivot points, to a second spring position and thereby cause said contacts to disengage from said respective terminals.

4,505,528

LOW INSERTION FORCE CONNECTION ARRANGEMENT

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Aug. 29, 1983, Ser. No. 527,639
Int. Cl.³ H01R *9/09*
U.S. Cl. 339—17 LM **20 Claims**



1. In combination, a first printed wiring board and a second printed wiring board, each printed wiring board including at least one terminal, and a low insertion force arrangement for establishing a connection between said printed wiring boards, said arrangement comprising:

at least one connection spring, said spring including first and second contacts, a pivot point, and first and second actuator engaging areas, said pivot point located between said actuator engaging areas, and said contacts each engageably positioned relative to a corresponding terminal of a respective one of said printed wiring boards;

a fulcrum positioned to engage said spring at said pivot point; and

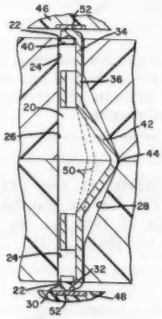
first and second actuators located proximate to said spring at said first and said second actuator engaging areas respectively, said actuators each positioned in a first position relative to said spring to pivot said spring about said pivot point and engage a respective one of said contacts with said terminal of a respective one of said printed wiring boards, and positioned in a second position relative to said spring to pivot said spring about said pivot point and disengage said respective contact from said terminal of said respective printed wiring board.

4,505,529

ELECTRICAL CONNECTOR FOR USE BETWEEN CIRCUIT BOARDS

Lee A. Barkus, Millersburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 1, 1983, Ser. No. 547,604
Int. Cl.³ H01R *23/72*
U.S. Cl. 339—17 M **2 Claims**



1. A connector for being positioned between and electrically interconnecting two devices having conductive traces such as printed circuit boards, comprising:

a. a housing of insulating material having a plurality of vertical passages therethrough with each passage having three longitudinally extending recesses spaced around the circumference thereof; and

b. a plurality of contact elements having a pair of spaced apart collars with three circumferentially spaced, elongated beams attached to and extending there between, each beam being formed to bend out laterally with a reversion point thereon being at the axial center of the element, and further having a contact surface attached to each collar and extending axially away therefrom, said contact elements being positioned in the passages with the contact surfaces extending outwardly therefrom and with each beam being in alignment with and adapted to be buckled into a recess by a compressive force which may be applied against the contact surfaces.

4,505,530

PILFER PROOFING SYSTEM FOR ELECTRIC UTILITY METER BOX

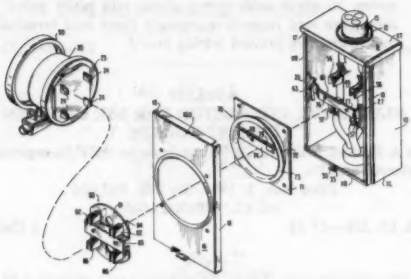
Robert B. Fennel, 241 Deerfield Rd., Bloomingdale, Ga. 31302

Division of Ser. No. 179,205, Aug. 18, 1980, Pat. No. 4,404,521.
This application Aug. 25, 1983, Ser. No. 526,236
Int. Cl.³ H01R *13/44*
U.S. Cl. 339—38 **2 Claims**

1. A plug-in meter contact terminal block set adaptor for use in pilfer proofing electrical power meters comprising, a rigid insulating substantially flat planar carrier member with a U-shaped central portion, said carrier member being adapted to fit within the meter opening of the power meter being pilfer proofed, a plurality of male plug conductor elements mounted in and projecting from one side of said carrier member for engagement with the contact terminal block set of the power meter being pilfer proofed,

a like plurality of female socket conductor elements each

integrally formed with a respective one of said male plug elements and projecting from the opposite side of said planar carrier member, said U-shaped central portion



dividing said conductor elements into pairs whereby when said adaptor is plugged into said power meter the hot conductor elements are protected in part by said U-shaped central portion.

4,505,531

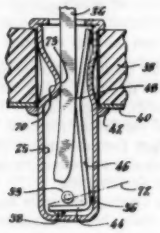
SOCKET TERMINAL AND CONNECTOR

Edwin A. Miller, 11 Old Elm Rd., Fairfield, Conn. 06432

Filed Aug. 29, 1983, Ser. No. 527,109

Int. Cl.³ H01R *21/28, 11/22*

U.S. Cl. 339—64 R **27 Claims**



1. An improved socket terminal comprising:

a. a housing member and a terminal member;

b. said housing member formed of an annular-shaped body having an inner wall surface a closure segment and a longitudinal axis thereof;

c. said housing body closed at one end thereof by said closure segment and having an entrance aperture at an opposite end for entrance of a plug terminal body therein;

d. said terminal member formed of a body of electrically-conductive, resilient material having first and second segments thereof;

e. said terminal member positioned in said housing body and adapted to engage a plug terminal body upon entrance thereof into said housing body and to establish contact between said plug body and said housing body;

f. said first terminal member segment extending in a direction transverse to said longitudinal axis;

g. said second terminal member segment having a bow-shaped configuration extending generally in the direction of said axis for forming a deflectable constriction through which said plug body extends and whereby the entry of said plug body deflects said second terminal segment into engagement with the inner wall of said housing;

h. said terminal member unrestrained for rotatable motion about said axis within said housing body in the absence of a male plug body, and, restrained against rotation after entry of said male plug body; and,

i. pivot means positioned between said first terminal member segment and said housing closure segment for increasing deflection of said second terminal segment thereby increasing a resilient force between said housing inner wall, said second terminal segment and a plug body positioned in said housing.

4,505,532

ARRAY PACKAGE CONNECTOR

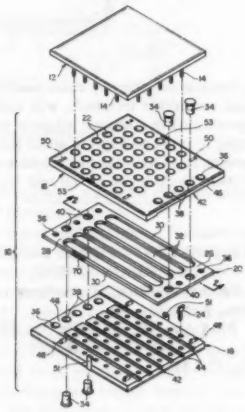
Jean-Patrick Hine, San Carlos, and Thomas H. McGaffigan, Redwood City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 401,176, Jul. 23, 1982, Pat. No. 4,468,076. This application Jun. 16, 1983, Ser. No. 504,916

The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.

Int. Cl.³ H01R *13/20, 13/635*

U.S. Cl. 339—75 M **45 Claims**



1. A connector comprising:

a first board having a plurality of openings formed therethrough;

a second board having a plurality of openings formed therethrough, said second board being mounted generally parallel to said first board, the openings in said first board being complementary to the openings in said second board; and

a motion-transmitting means of heat-recoverable metal having a martensitic state and an austenitic state, said means interconnecting said first and second boards to move the boards relative to each other, said means being expanded dimensionally while in its martensitic state, a change from its martensitic state to its austenitic state recovering said means to its non-expanded dimension, thus moving said boards relative to each other.

4,505,533

APPARATUS FOR CLAMPING ELECTRIC CONDUCTORS, PARTICULARLY WIRES

Holger Nicolaisen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jan. 10, 1983, Ser. No. 456,818

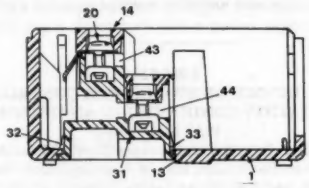
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1982, 3201169

Int. Cl.³ H01R *9/00*

U.S. Cl. 339—198 R **4 Claims**

1. Apparatus for clamping electrical conductors comprising a housing having a base, side walls joined to the base and a cover member joined to the side walls in spaced relationship to

the base, an insert block having a plurality of side by side guide passages, a clamp means for each guide passage for clampingly engaging an electrical conductor, each of the clamp means including a clamp member mounted in the respective guide passage for being held against rotation therein and a screw threaded in each clamp member, said base having an insert block cut-out for having the insert block extending therein and said passages opening toward the cover member, and said cover member having holes aligned with said screws and passages, said insert block having openings for access by the electrical conductors to said clamp means, the cover member comprises a first and a second strip with the first strip being of a greater spacing from the base than the second strip and offset



therefrom, the first strip having the above mentioned holes, that the insert block has a second plurality of guide passages in side by side relationship that open toward the second strip, that there is provided a second clamp means for each of the second passages for clampingly engaging an electrical conductor, each of the second clamp means including a clamp member mounted in the respective second guide passage for being held against rotation therein and a screw threaded in each of the second clamp members, said second strip having holes aligned with the second passages and second clamp means screws, and that said insert block has openings for access by the electrical conductors to the second clamping means, and that the housing and cover member are made in one piece.

4,505,534

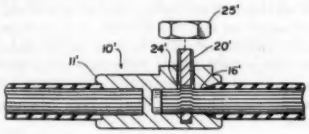
CABLE CONNECTOR AND METHOD

John K. Shannon, 200 S. Vincennes Cir., Racine, Wis. 53402

Filed Oct. 4, 1982, Ser. No. 432,650

Int. Cl.³ H01R *4/30*

U.S. Cl. 339—263 R **4 Claims**



1. A cable connector comprising, in combination,
a body,
said body having an anchor portion,
said body having a cable tube interior portion,
a clamp slot in open communication from the exterior of the body to the cable tube portion,
a cable clamp of flat configuration with threads at its end portion and having a central cable grip hole,
said cable clamp being a stamped part, with threads extending from one end therefrom and stamped thereon,
said cable clamp being aligned in the cable slot, and
threaded means for engaging the threaded end of the clamp to misalign the same with the cable tube thereby engaging the strand end of a cable.

4,505,535

INFRARED OBJECTIVE LENS SYSTEMS

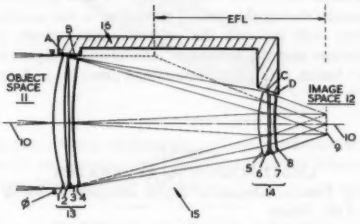
Iain A. Neil, Strathblane, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

Filed May 23, 1983, Ser. No. 498,004

Claims priority, application United Kingdom, Feb. 6, 1982, 8216035

Int. Cl.³ G02B *9/34*

U.S. Cl. 350—1.3 **8 Claims**



1. An infrared objective lens system for delivering infrared radiation to a radiation detecting system, said objective lens system comprising a primary lens group and a secondary lens group mounted in spaced apart relationship on a common support assembly and aligned on a common optical axis, wherein the primary lens group is arranged to accept infrared radiation from a pupil, the secondary lens group is arranged to accept radiation from the primary lens group and to form a real image thereof at an external image surface, the primary lens group being substantially self-compensated for chromatic aberrations, positively powered, and made of material the refractive index of which is relatively temperature insensitive, the secondary lens group is positively powered, introduces minimal chromatic aberrations, and is formed by a positively powered lens made of material the refractive index of which is relatively temperature insensitive and a negatively powered lens made of material the refractive index of which is relatively temperature sensitive, the arrangement being such that thermal aberrations introduced by the primary lens group and relative displacements of the primary lens group and secondary lens group caused by thermal expansion of the support assembly are compensated by thermal aberration introduced by said negatively powered lens so that the objective system is rendered substantially passively athermal.

4,505,536

OPTICAL DEVICE FOR REAL-TIME AMPLIFICATION OF THE RADIANT ENERGY OF A BEAM

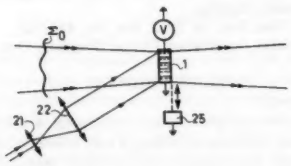
Jean-Pierre Huignard, and Abdellatif Marrakchi El Fellah, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 2, 1982, Ser. No. 354,049

Claims priority, application France, Mar. 13, 1981, 81 05135

Int. Cl.³ G03H *1/02*

U.S. Cl. 350—3.64 **14 Claims**



1. An optical device for real-time amplification of the radiant energy of a beam, comprising
a photosensitive recording material having terminals and in which a grating structure of photoinduced refractive-

index strata is recorded in real time, said strata grating structure being obtained by interference within the mass of said material between an incident object beam emanating from a coherent source and a reference beam which is coherent with said object beam, a transfer of energy being carried out between said reference beam and said object beam,

means for applying an electric field, at right angles to the plane of the strata, to the terminals of said material, and

mechanical means for displacement of said photosensitive material during the time of recording in the material, the phase shift between the refractive-index strata grating structure and the pattern of interference fringes of these two beams being thus maintained constant and equal to $\pi/2$.

4,505,537

LIGHT SCANNING APPARATUS

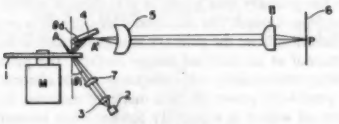
Hiroyoshi Funato, Chigasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jun. 23, 1983, Ser. No. 507,177

Claims priority, application Japan, Jun. 24, 1982, 57-107588; Jun. 24, 1982, 57-107589

Int. Cl.³ G02B *27/17*

U.S. Cl. 350—3.71 **10 Claims**



1. A light scanning apparatus for scanning along a scan line on a scanning surface by a light beam comprising:

a rotating disk supported to be driven to rotate in a predetermined direction at constant speed;

a plurality of equidistant linear gratings fixedly mounted on said disk as arranged in the form of a circle;

a semiconductor laser for emitting light;

a first optical system for leading said light from said laser to be incident upon one of said gratings; and

a second optical system for leading the light diffracted by said one grating to said scanning surface, said second optical system being so structured to maintain the surface of said one grating and said scanning surface to be in conjugate relation in terms of geometrical optics in the direction normal to the scanning direction of said scan line.

4,505,538

ELECTROCHROMIC DISPLAY DEVICES

Francois Toussaint, Montigny-le-Tilleul, and Jean-Claude Hoyois, Ham-sur-Heure, both of Belgium, assignors to Glaverbel, Brussels, Belgium

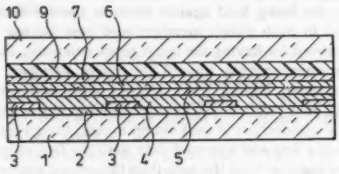
Filed Sep. 10, 1982, Ser. No. 416,712

Claims priority, application United Kingdom, Oct. 19, 1981, 8131467

Int. Cl.³ G02F *1/23*

U.S. Cl. 350—357 **4 Claims**

1. An electrochromic device comprising a solid layered structure, said structure including a pair of electrodes and an electrochromic layer sandwiched between said pair of electrodes, in combination with: a pair of vitreous sheets of which at least one is transparent, said device being sandwiched between said pair of vitreous sheets; and a reservoir of ionisable material held between said sheets, said reservoir being a gas-filled space within said device and being a controlled-humidity source of H^+ions, wherein on the application of an electrical potential between said pair of electrodes, ions are permitted to



migrate betwęen said ionisable material and said electrochromic layer.

4,505,539

OPTICAL DEVICE OR SWITCH FOR CONTROLLING RADIATION CONDUCTED IN AN OPTICAL WAVEGUIDE

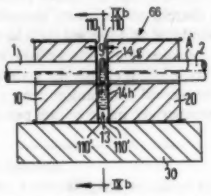
Franz Auracher, Baierbrunn; Hermann Buerk, Maisach; Rudolf Keil; Michael Stockmann, both of Munich; Kaspar Weingand, Duernbach, and Karl-Heinz Zeitler, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,708

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138968

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.15 **19 Claims**



1. An optical device for controlling radiation conducted in an optical waveguide, said device comprising an optical waveguide having an end surface and means for controlling the entrance and exit of a beam of radiation from said end surface of the optical waveguide, said means including a liquid medium being disposed adjacent said end surface, said medium consisting of a specific amount of a free-flowing liquid material having a surface tension, said means including means for moving the free-flowing liquid into and out of the beam path, and said means for moving said liquid including means for changing the surface tension.

4,505,540

SPLICED PORTION HOUSING STRUCTURE FOR OPTICAL FIBER IN OPTICAL SUBMERGED REPEATER

Kahei Furusawa, Kamifukuoka; Makoto Nunokawa, Kawasaki; Yoshihiro Ejiri, Tokyo; Hitoshi Yamamoto, Yamato; Yoshihiko Yamazaki, Yokohama, and Koichi Tatekura, Hiratsuka, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1982, Ser. No. 340,350

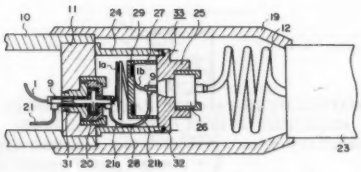
Claims priority, application Japan, Jan. 20, 1981, 56-5897

Int. Cl.³ G02B *5/14, 7/26*

U.S. Cl. 350—96.20 **8 Claims**

1. A structure for housing a spliced portion of an optical fiber of a submarine cable connection to an optical fiber of an optical submerged repeater comprising: a submarine cable

coupling member coupled to the optical fiber submarine cable for coupling said submerged repeater threreto, the submerged repeater having a pressure-resisting housing having a fluid-tight wall, a joint ring coupling between the submerged repeater housing and said submarine cable coupling member and in use in transmitting tension forces between the optical fiber submarine cable and the submerged repeater, a pressure-resisting elongated tubular member extending axially from said submerged repeater wall internally of said joint ring and having a fluid-tight end wall closing the end of the tubular member defining jointly with the tubular member and said wall of the submerged repeater a fluid-tight, hermetically sealed, pressure-resisting chamber capable of withstanding a hydraulic pressure when submerged in a deep sea or ocean, said tubular member having an axial length less than said joint ring, a tail cable extending from said submarine cable coupling member and constituting a unitary structure having at least one optical fiber therein defining a signal path and a power supply feeder, a



feedthrough hermetically mounted on said end wall for providing a hermetically sealed entry of said optical fiber and said power supply feeder of said tail cable into said chamber, another feedthrough hermetically mounted on said submerged repeater wall for providing a hermetically sealed entry for at least one optical fiber and a power supply feeder from said submerged repeater into said chamber, and internally of said chamber both a splice connection between the optical fiber from said submerged repeater and the optical fiber from said first-mentioned feedthrough and another independent splice connection between the power supply feeder from said first-mentioned feedthrough and said power supply feeder from said submerged repeater, the axial length of said tubular member being sufficient to allow making all said splices internally thereof while in an open condition at one end thereof and subsequently hermetically sealing the tubular member mounted on said repeater wall, thereby defining said chamber in a closed hermetic condition.

4,505,541

RODENT-RESISTANT NON-CONDUCTIVE OPTICAL FIBER CABLE

Robert J. Considine, Ojai; Joseph F. Schirtzinger, Pasadena, and Kenneth M. Stiles, San Dimas, all of Calif., assignors to Sea-Log Corporation, Pasadena, Calif.

Filed Mar. 31, 1982, Ser. No. 363,796
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.23 **36 Claims**

1. A non-metallic rodent-resistant optical fiber cable comprising:

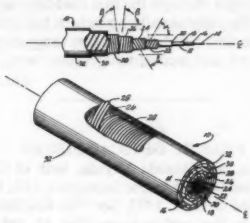
(a) an inner core comprising at least one optical fiber, said inner core defining a cable axis;

(b) an organic cushion layer surrounding said inner core;

(c) a first layer of helically-wound resin-bonded inorganic fibers wound about the cushion layer at a first lay angle relative to the cable axis of up to about 45 degrees;

(d) a second layer of helically-wound resin-bonded inorganic fibers wound about the first layer of helically-wound resin-bonded inorganic fibers at a second lay angle opposite to the direction of lay of the first lay angle and at a lay angle relative to the cable axis of up to about 45 degrees; and

(e) at least one additional layer of helically-wound resin-bonded inorganic fibers wound about the second layer of helically-wound inorganic fibers at a wrap angle greater than about 60 degrees and less than 90 degrees relative to the cable axis, said layers of helically-wound resin-bonded



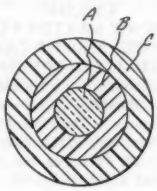
inorganic fibers cooperating to form a substantially balanced resin-bonded fiber assembly which is substantially non-twisting and non-kinking.

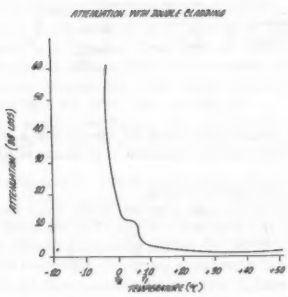
4,505,542

THERMOSTATIC FIBER OPTIC WAVEGUIDES

Raymond Clarke, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 136,076, Mar. 31, 1980, Pat. No. 4,373,768. This application Sep. 23, 1982, Ser. No. 422,481
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.33 **11 Claims**





1. A waveguide comprising a core, a first light transmissive cladding disposed on and around the exterior surface of the core, and a second cladding disposed on and around the exterior surface of the first cladding, the refractive index of the first cladding being less than the refractive index of the core at temperatures greater than a first temperature, T_1, and being greater than or equal to the refractive index of the core at temperatures less than T_1, the refractive index of the second cladding being less than the refractive index of the first cladding at temperatures greater than a second temperature T_2 and greater than or equal to the refractive index of the first clad-

ding at temperatures less than T_2, T_2 being less than T_1, wherein at temperatures greater than T_1 the waveguide is capable of transmitting light through the core, and at temperatures less than T_1 and greater than T_2 the waveguide is capable of transmitting light through the first cladding, and at temperatures less than T_2, substantially no light is transmitted through the core and the first cladding, said first temperature being less than 200° C., and said second temperature being greater than −20° C.

4,505,543

PLASTIC OPTICAL FIBERS

Yoshinobu Ueba, and Shinichi Miyake, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 14, 1982, Ser. No. 434,286
Claims priority, application Japan, Oct. 14, 1981, 56-164597
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.34 **9 Claims**

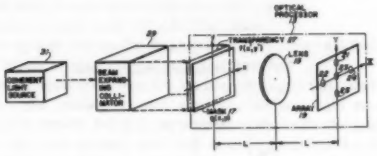
1. A plastic optical fiber comprising a core of a copolymer of an alkyl methacrylate and a styrene derivative, wherein said styrene derivative is selected from the group consisting of p-phenylstyrene, p-tert-butylstyrene, p-cyanostyrene, p-iodostyrene, a,b,b-trifluorostyrene, perfluorostyrene and 2,3,4,5,6-pentafluorostyrene, and a cladding of a copolymer of vinylidene fluoride and a perfluoroolefin provided on said core, the polymer of said cladding having a melting point of at least 120° C. and perfluoroolefin content in the range of from 3 mol% to 70 mol%.

4,505,544

SPATIAL FREQUENCY MULTIPLEXED COHERENT OPTICAL PROCESSOR FOR CALCULATING GENERALIZED MOMENTS

Jerry A. Blodgett, Annandale, Va.; Harold H. Szu, Bethesda, Md.; C. Lee Giles, Potsdam, N.Y., and Ravindra Athale, Annandale, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 10, 1982, Ser. No. 387,133
Int. Cl.³ G06G *9/00*
U.S. Cl. 350—162.13 **9 Claims**



1. An optical processor for computing a plurality of moments of the intensity function of an image in parallel comprising:

a Fourier-transform lens;

a holographic mask disposed in the front focal plane of the lens, the transmittance g(x,y) of the mask being proportional to the sum of the generating functions of each of the desired moments respectively multiplied by a corresponding spatial carrier in accordance with the following equation:

$$g(x,y) = A \sum_{m=-M}^{M} \sum_{n=-N}^{N} g_{mn}(x,y) e^{j(mu_0x + nv_0y)},$$

where x and y are the two variables defining the plane of the mask, A is a proportionality constant, $g_{mn}(x,y)$ is the generating function of the mn^{th} moment, there being $2M \times 2N$ such moments, $e^{j(mu_0x+nv_0y)}$ is the separate spatial carrier for each generating function $g_{mn}(x,y)$, and u_o and v_o are arbitrary scaling factors; and

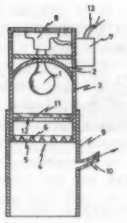
a two-dimensional array of photodetectors disposed in the back focal plane of the lens, the individual photodetectors being spatially separated so that when the image is placed at the plane of the holographic mask, the lens forms in its back focal plane the Fourier transform of the intensity function of the image times the transmittance of the mask and each of the desired moments is found at a respective one of the photodetectors.

4,505,545

APPARATUS FOR APPLYING LIGHT THROUGH AN OPTICAL GRID

Miguel Salia-Munoz, 7a. Privada de Azafran 14 Col., Granjas Mexico, Mexico

Filed Jan. 21, 1983, Ser. No. 459,950
Claims priority, application Mexico, Aug. 27, 1982, 194194
Int. Cl.³ G02B *27/00*; A61N *5/00*
U.S. Cl. 350—321 **3 Claims**



1. Apparatus for applying light energy, comprising

a light source,

a reflector mounted on one side of said light source, and

an optical grid mounted on the opposite side of said light source,

said optical grid being substantially flat on the side thereof opposite said light source and defining a multiplicity of openings,

each of said openings having the shape of a pyramid frustum having square bases and four isosceles trapezoidal sides,

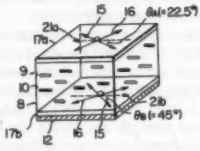
the larger of said bases being on the side of said grid towards said light source and the smaller of said bases being on the side of said grid opposite said light source.

4,505,546

LIQUID CRYSTAL DISPLAY DEVICE

Takao Umeda; Yuzuru Simazaki, both of Hitachi; Tatsuo Igawa, Kitaibaraki; Seikichi Tanno, Hitachi; Ken Sasaki, Mobara, and Takao Miyashita, Kumagaya, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 19, 1982, Ser. No. 443,032
Claims priority, application Japan, Nov. 20, 1981, 56-185319
Int. Cl.³ G02F *1/13*
U.S. Cl. 350—334 **8 Claims**



1. A liquid crystal display device comprising:

a pair of facing substrates, each of said substrates being provided with at least an electrode at a registered portion,

at least one of said substrates being formed of a birefringent material having slow and fast axes of birefringence;

a liquid crystal material mixed with a dichroic dye and held between said substrates, a picture element being made up of a pair of said registered electrodes and a portion of said liquid crystal material sandwiched between said electrodes; and

a reflecting plate adjacent to one of said substrates;

wherein the other substrate is formed of said birefingent material having a slow and fast principal axes of birefringence, and an angle between the direction of the absorption axis of said dichroic dye and one of said principal axes of birefingence of said other substrate is made substantially equal to 22.5° when the direction of the absorption axis of said dichroic dye is aligned parallel to said other substrate.

4,505,547

LIQUID CRYSTAL DISPLAY DEVICE WITH REFLECTION PREVENTIVE FUNCTION

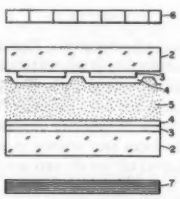
Nobuyuki Sekimura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1981, Ser. No. 298,468

Claims priority, application Japan, Sep. 9, 1980, 55-125087; Sep. 10, 1980, 55-125501; Sep. 10, 1980, 55-125496; Sep. 10, 1980, 55-125497; Sep. 10, 1980, 55-125498; Sep. 10, 1980, 55-125499; Sep. 10, 1980, 55-125500

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—339 R **7 Claims**



1. A liquid crystal device having a reflection preventing function, comprising:

a liquid crystal material; and

two electrode plates positioned to sandwich said liquid crystal material therebetween; at least one of said electrode plates including a transparent substrate, a transparent electrode provided on said transparent substrate, and a dielectric layer provided on said transparent electrode; said transparent substrate having a refractive index n_0, said transparent electrode having a refractive index n_1 and a geometrical thickness d_1, said dielectric layer having a refractive index n_2 and a geometrical thickness d_2 and said liquid crystal material having a refractive index n_{LC} satisfying the relations:

$$n_0<n_1,\ n_2<n_1,\ \text{and}\ n_{LC}<n_2,$$

wherein n_1d_1 and n_2d_2 are so selected as to satisfy the following relations:

$$0.1\times(2N_1-1)\lambda\leqq n_1d_1\leqq 0.15\times(2N_1-1)\lambda$$

$$0.26\times(2N_2-1)\lambda\leqq n_2d_2\leqq 0.39\times(2N_2-1)\lambda$$

wherein λ is a design wavelength, and N_1 and N_2 are arbitrary positive integers.

4,505,548

BISTABLE LIQUID CRYSTAL TWIST CELL

Dwight W. Berreman, New Providence, and William R. Heffner, Plainfield, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 198,294, Oct. 20, 1980, abandoned. This application Oct. 12, 1983, Ser. No. 540,709

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—346 **3 Claims**

1. A liquid crystal twist cell comprising

(a) a cholesteric liquid crystal which, in an unstrained state, assumes a helical configuration,

(b) bounding surfaces, at least one of which transmits electromagnetic radiation at a wavelength of interest,

(c) means to align the liquid crystal molecules adjoining the bounding surfaces,

(d) means to apply a voltage difference across at least a portion of the cell, and

(e) means to optically discriminate between at least two clear states corresponding to different orientations of the liquid crystal,

the invention characterized in that

the liquid crystal has at least two clear stable states when in the presence of a single nonzero holding voltage, which clear stable states may be switched from one to the other without passing a disclination through the cell.

4,505,549

LIQUID CRYSTAL DISPLAY DEVICE

Yasutaka Shimidzu, Toyonaka; Hirohito Kenmochi, Takatsuki; Toshihiko Ueno, and Chizuka Tani, both of Tokyo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Nippon Electric Co., Ltd., Tokyo, both of, Japan

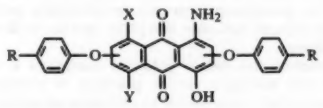
Filed Dec. 14, 1981, Ser. No. 330,487

Claims priority, application Japan, Jan. 12, 1981, 56-3677

Int. Cl.³ G02F *1/13*; C09K *3/34*; G09F *9/00, 9/35*

U.S. Cl. 350—349 **10 Claims**

1. A liquid crystal display device comprising a liquid crystal composition filled between one pair of electrode substrates at least one of which is transparent, said liquid crystal composition containing one or more blue dye(s) represented by the following general formula:



wherein one of X and Y is an amino group and the other is a hydroxyl group; and R is an alkyl group, alkoxy group, alkylthio group, aryl group, aralkyl group, aryloxy group, arylthio group, aralkyloxy group, aralkylthio group, halogen atom, piperidino group, piperazino group, morpholino group, pyrrolidino group or a group

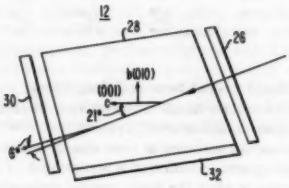
in which R_1 and R_2 are a hydrogen atom, alkyl group, aryl group or aralkyl group; provided that the alkyl chain and the aryl ring in substituents R, R_1 and R_2 may optionally be substituted with alkoxy or alkyl.

4,505,550

INFRARED ACOUSTO-OPTIC TUNABLE FILTER

Kenneth B. Steinbruegge, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 2, 1982, Ser. No. 345,126
Int. Cl.³ G02F 1/11
U.S. Cl. 350—372 **3 Claims**



1. An improved infrared acousto-optic tunable filter for use with collimated infrared radiation comprising in combination: an input polarizer; an output polarizer; an acousto-optic member opticall" aligned with said input polarizer and said output polarizer, which acousto-optic member comprises an acousto-optic birefrigent thallium-arsenic-selenide (Tl_3AsSe_3) crystal having polished, uncoated input and output faces, which input face is normal to the incident infrared radiation and which output face is normal to the infrared radiation diffracted by said acousto-optic tunable filter, and an rf transducer means coupled to a side face of the crystal member other than the input or output face of the crystal for launching acoustic waves in the crystal which are non-collinear with, and which interact with a selected bandwidth portion of polarized input infrared radiation which is propagated at about 21° to the crystallographic axis, in order to shift the polarization of the selected bandwidth portion of the input infrared radiation by 90 degress so that it is distinguishable from the unshifted input infrared radiation, which selected bandwidth portion is a function of the rf energy input frequency, said selected bandwidth portion being over the range of about 1.3–16 micrometers; wherein the input polarizer comprises a wire grid polarizer having a planar, plurality of parallel closely spaced conductors with the spacing between adjacent conductors being less than the wavelength of the input infrared radiation, the wire conductor spacing being at least about 1000 wires per millimeter with a grid spacing of about 0.5 micrometers;

and wherein the parallel closely spaced conductors are aligned with the plane formed by the b-c crystalline axes of the acousto-optic crystal to efficiently polarize the input infrared radiation in a plane parallel to the b-c crystal plane,

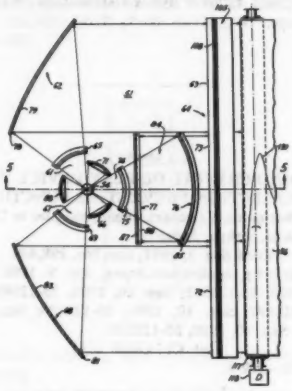
and wherein the output polarizer comprises a wire grid polarizer having a planar, plurality of parallel closely spaced conductors spaced to pass infrared radiation transmitted through the acousto-optic member, the wire conductor spacing being at least about 1000 wires per millimeter with a grid spacing of about 0.5 micrometers with the parallel conductors of the output polarizer aligned transversely to the conductors of the input polarizer, whereby only the 90 degree shifted polarized selected bandwidth portion of the infrared radiation tramsitted through the acousto-optic member passes through the output polarizer.

4,505,551

ILLUMINATION AND LIGHT GATE UTILIZATION METHODS AND APPARATUS

John H. Jacobs, Altadena, Calif., assignor to Transamerica Delaval Inc., Lawrenceville, N.J.

Continuation of Ser. No. 925,132, Jul. 17, 1978, abandoned, which is a division of Ser. No. 776,157, Mar. 10, 1977, abandoned. This application Nov. 29, 1979, Ser. No. 98,430
Int. Cl.³ G02F 1/03; G01D 5/32; F21V 7/09
U.S. Cl. 350—384 **176 Claims**



1. In a method of selectively illuminating a surface, the improvement comprising in combination the steps of:

providing a slit traveling transversely to a longitudinal dimension of said slit for a predetermined distance;

providing a source of spatially concentrated light;

spreading light from said source in a plane parallel to the transverse travel of the slit and across said predetermined distance of transverse travel of the slit;

collimating said spread light; and

focusing said spread light into a traveling spot on said surface by imaging said spread light from said source through said traveling slit onto said surface anamorphically only as to a dimension of said spatially concentrated light corresponding to said longitudinal dimension of the slit.

4,505,552

ADJUSTABLE ELECTRO-OPTICAL DEVICE

Peter Prohaska, Nuremberg, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 19, 1983, Ser. No. 486,572
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214583
Int. Cl.³ G02F 1/03
U.S. Cl. 350—392 **10 Claims**

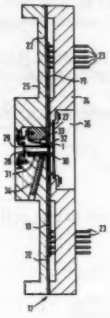
1. Electro-optical apparatus for outputting a line of picture information, said apparatus comprising;

a plurality of electrically controllable electro-optical transparent substrates, each said substrate having a first and second longitudinally extending edge;

a frame for supporting said plurality of substrates in a linear array;

adjusting means for individually adjusting each of said substrates relative to said frame in a direction perpendicular to a respective said first longitudinal edge; and

holding means associated with each said second longitudinal edge for resiliently holding the second edges relative to



said frame and for urging said respective substrates towards said adjusting means.

4,505,553

MICROSCOPE OBJECTIVE

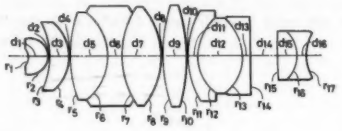
Yoshito Asoma, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 517,057

Claims priority, application Japan, Aug. 11, 1982, 57-138576

Int. Cl.³ G02B *9/62, 21/02*

U.S. Cl. 350—414 **7 Claims**



1. A microscope objective comprising a first, second, third, fourth, fifth and sixth lens components wherein said first lens component is a positive meniscus lens having a concave surface with a small radius of curvature on the object side, said second lens component is a positive meniscus lens arranged to be concave toward the object side, said third lens component is a cemented lens component consisting of three lens elements, i.e., a biconvex lens, biconcave lens and biconvex lens, said fourth lens component has positive refractive power, said fifth lens component has positive refractive power, and said sixth lens component is a cemented doublet consisting of a positive lens and negative lens, said microscope objective being arranged to fulfill the conditions (1) through (5) shown below:

(1) $5.0 \leqq f_1/f \leqq 6.7$

(2) $4.3 \leqq -f_{56}/f \leqq 6.5$

(3) $2 \leqq -f_{3n}/f \leqq 3$

(4) $\nu_{10} \leqq 31$

(5) $n_9 \geqq 1.6$

where, reference symbol f represents the focal length of the lens system as a whole, reference symbol f_1 represents the focal length of the first lens component, reference symbol f_{56} represents the total focal length of the fifth and sixth lens components, reference symbol f_{3n} represents the focal length of the biconcave lens constituting the third lens component, reference symbol ν_{10} represents Abbe's number of the positive lens constituting the sixth lens component, and reference symbol n_9 represents the refractive power of the lens element arranged on the image side in the fifth lens component.

4,505,554

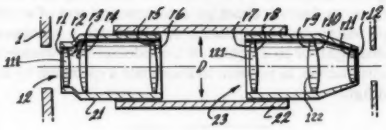
ILLUMINATION TRANSMISSION SYSTEM FOR FORMAT ADAPTATION IN PROJECTIONS

Fredrik F. De Hubry, 311 S. Doheny Dr., Los Angeles, Calif. 90048

Filed May 22, 1979, Ser. No. 41,486

Int. Cl.³ G02B *13/22, 21/00*

U.S. Cl. 350—518 **4 Claims**



1. Optical device for transmitting the illumination energy in a first window of a projector to a second window spaced from the first window in direction of a projector axis, the illumination energy being provided by a projector lamp and condenser mirror to the first window, a projector objective is to be placed behind the second window, the objective having a principal point, comprising:

a first group of positive acting lenses positioned in relation to and behind the first window so that a focal point of the first group is near the first window and a projecting beam as provided by the projection lamp and converging towards the first window is converted by the first group into a beam of near-parallel rays; and

a second group of positive-acting lenses being disposed in between and in relation to the first and second windows to focus, in the absence of the first group, a central point of the first window through the second window and into a point in which to place the principal point of the projection objective behind the second window.

4,505,555

ILLUMINATING DEVICE FOR MICROSCOPES

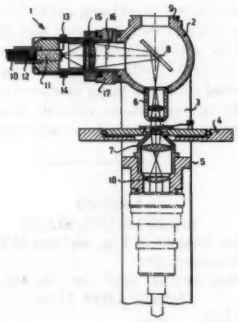
Horst Piller, and Reinhold Kipper, both of Aalen, Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,284

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1981, 3147998

Int. Cl.³ G02B *21/06*

U.S. Cl. 350—527 **7 Claims**



1. A Köhler illuminating device for microscopes, said device comprising a light guide serving as a uniform increased-area source of secondary light, said light guide including a bundle of glass fibers having an exit end, a glass body engaged against said end for receiving light transmitted through said bundle and for producing a substantially uniform luminous density

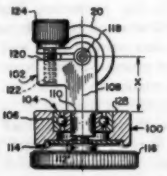
distribution at a light exit surface of said glass body, a housing containing said glass body and said exit end of said bundle, an aperture diaphragm (13) in said housing in the immediate vicinity of said light exit surface of said glass body to control the aperture of a light beam issuing therefrom, an illuminating field diaphragm (16) also in said housing in the path of light passing said aperture diaphragm, a collector (15) located in the path of light between said aperture diaphragm and said illuminating field diaphragm, and means for attaching said housing selectively as desired, either on a microscope arm of a reflected-light microscope, in position to illuminate a specimen by reflected light, or to a holder of a condenser of a transmitted-light microscope, in position to illuminate a specimen by transmitted light.

4,505,556

ROTATABLE SPECIMEN MOUNT FOR OPTICAL FIBER MICROSCOPES

William D. Bridson, Ontario, and Edward N. Esmay, Webster, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,525
Int. Cl.³ G02B *21/26*
U.S. Cl. 350—532 **6 Claims**



1. Apparatus for rotatably holding a fiber optic cable relative to the optical axis of a microscope to permit examination of the end of said cable, comprising:

a support mounted to said microscope;

first means rotatably mounted by a low friction bearing assembly received within an aperture formed in said support;

second means for releasably securing said cable to said first means, said second means positioning said cable end relative to said optical axis; and

third means mounted to said support and said first means for providing tension therebetween, said first means being rotatable to, and holdable in, any one of a plurality of angular positions with respect to said optical axis, whereby said cable end being examined may be viewed in a plurality of orientations relative to said optical axis without being moved relative to said second means.

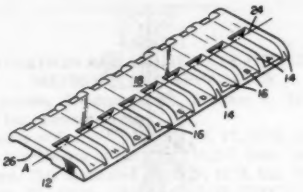
4,505,557

MICROSCOPE SLIDE

Tipton L. Golias, Beaumont, Tex., assignor to Helena Laboratories, Inc., Beaumont, Tex.

Filed Aug. 16, 1982, Ser. No. 408,247
Int. Cl.³ G02B *21/34*
U.S. Cl. 350—536 **10 Claims**

1. A microscope slide having a plurality of grooves forming a plurality of specimen chambers, the slide comprising an elongated base portion, a plurality of upstanding transverse separators integrally formed with said elongated base portion, and a cover portion, said cover portion integrally formed with and interconnecting said upstanding transverse separators to form therewith and with the base portion the plurality of specimen chamber said formed specimen chamber defining an additional groove in the elongated base portion thereof, said



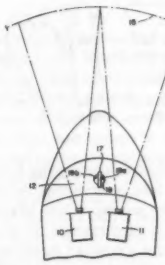
additional groove adjacent to one of the upstanding transverse separators.

4,505,558

METHOD OF MODIFYING PROJECTED IMAGES

Francis G. Albers, Ormond Beach, and Fernando B. Neves, Daytona Beach, both of Fla., assignors to General Electric Company, Syracuse, N.Y.

Filed Feb. 14, 1984, Ser. No. 579,920
Int. Cl.³ G03B *21/14, 37/04, 41/00*
U.S. Cl. 354—4 **13 Claims**



1. A method for modifying the image projected onto a display area by an optical system to obtain an image having desired characteristics, said method comprising the steps of:

positioning a section of light-sensitive material in said optical system;

projecting light onto said display area from a location external to said optical system to provide information concerning said desired characteristics;

exposing said section of light-sensitive material to light from said display area directed to said section through said optical system, said exposure step being adapted to record on said section of light-sensitive material said information contained in the light emanating from said display area;

processing said section of light-sensitive material to render said information visible thereon, said processed section forming an attenuator adapted to modify light passing therethrough in accordance with the visible information thereon; and

installing said attenuator in said optical system in the same position formerly occupied by said section of light-sensitive material.

4,505,559

METHOD AND MEANS FOR COMPENSATING FOR IMAGE MOTION IN AN AERIAL CAMERA

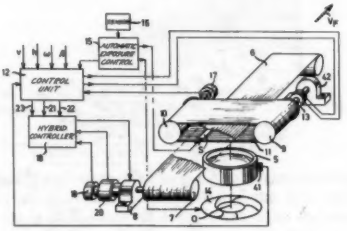
Reinhard Prinz, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 508,929

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314227

Int. Cl.³ G03B *39/04*

U.S. Cl. 354—66 **11 Claims**



1. A method of compensating for image motion in an aerial camera in which a slotted shutter (**11**) moves transverse to the direction of film (**6**) transport and in which film transport is parallel to the direction of flight, and further in which film-transport speed V_T in the image plane is controlled as a function of the ratio of the speed of flight V_F to the altitude h, the focal length f of the camera lens, and the inclination β' of the camera, characterized by the fact that the position (x) of the shutter slot (S) is continuously measured in the course of making an exposure, and the drive motor (**8**) for film transport (**7**) is governed by a control signal derived from the measured position (x) of the slot (S).

4,505,560

CAMERA BACK

Katsuya Kozai, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

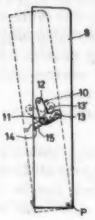
Filed Oct. 24, 1983, Ser. No. 544,911

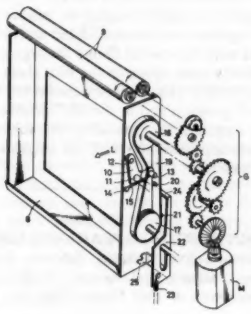
Claims priority, application Japan, Oct. 22, 1982, 57-185414

Int. Cl.³ G03B *17/50, 19/10, 9/02*

U.S. Cl. 354—86 **4 Claims**

1. A camera back having a housing with a film discharge slot in the top thereof, a frame for a film container pivotally mounted in said housing adjacent the bottom thereof between a first picture taking position and a second film discharging position, a pair of processing solution spreading rollers rotatably mounted at the top of said frame with the nip region thereof being aligned with said slot when said frame is in said second position, and motor driven means mounted in said housing for rotating said rollers, moving said frame from said first position to said second position, feeding a film to said





rollers when said frame is in said second position, and moving said frame from said second position back to said first position.

4,505,561

MULTI-IMAGE CAMERA

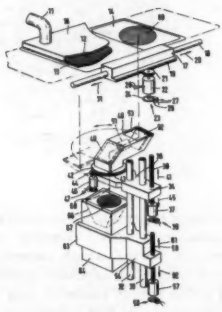
Leo H. Beckman, Willem de Merodestraat, Delft, and Abraham Groeneweg, Dr. Albert Schweitzer Laan 103, 3146 Maassluis, both of Netherlands

Filed May 13, 1983, Ser. No. 494,369

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3217938

Int. Cl.³ G03B *29/00*

U.S. Cl. 354—123 **17 Claims**



1. In an apparatus for transmitting pictures from a screen to pre-determined panels on a film sheet, said apparatus comprising

a film sheet,

a screen,

first and second mirrors which are oriented at an angle of 45°

from verticle, and disposed in a ray path between the screen and the film sheet,

a lens system which is disposed in the ray path, the optical axis of which is parrellel to the film sheet,

a moving device along one of the edges of the film sheet for moving the film sheet in an image plane of the film sheet,

and additional moving devices for moving the screen, the first and second 45° mirrors and the lens system,

the improvement wherein:

(a) the screen is parallel to the image plane of the film sheet,

(b) a base is provided which is parallel to the film sheet,

(c) a swivel flange is provided coaxial with the central axis of the screen which can be swivelled about the base through at least 180° and which is optically open towards the screen,

(d) an extension housing is carried on the swivel flange, in which the first and second 45° mirors together with the lens system are accommodated and which can be swivelled with the swivel flange through at least 180° and is optically open towards the film sheet,

(e) the optical axis of the extension housing is parallel in the 0° position and in the 180° position, and

(f) the length of the optical axis of the extension housing equals approximately half the length of the diagonal of the panels.

4,505,562

FILM SUPPORTING APPARATUS FOR CAMERAS

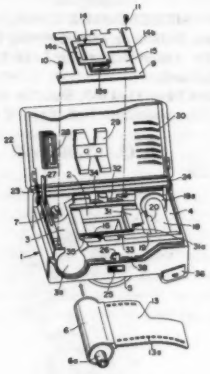
Hiroshi Hara, Tokyo; Takashi Tobioka, Saitamaken; Tetuo Nishizawa, Saitama, and Takeshi Yoshino, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 27, 1983, Ser. No. 536,398

Claims priority, application Japan, Sep. 30, 1982, 57-147144[U]

Int. Cl.³ G03B *1/48, 17/28*

U.S. Cl. 354—203 **5 Claims**



1. A film supporting apparatus for a camera for use with a film container including a coiled filmstrip having a leader previously drawn out thereof which camera is of the type having, on opposite sides of an exposure aperture, a film take-up chamber and a film supply chamber into which the container is inserted endwise; said film supporting apparatus comprising:

a pressure plate for holding a film flat in a film plane of the camera; and

a holding frame fixedly mounted on said camera, and means carried by said holding frame for resiliently holding said pressure plate in cantilever fashion so as to permit said pressure plate at the side adjacent the film take-up chamber to displace rearwardly in the direction parallel to the optical axis of said camera.

4,505,563

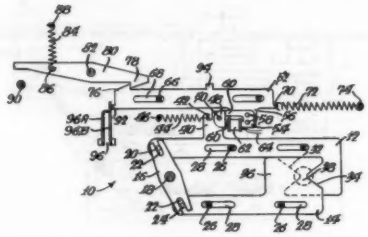
ELECTRONIC SHUTTER FOR STILL CAMERAS

Wan C. Wong, North Point, Hong Kong, and Shigeru Oshima, Tokyo, Japan, assignors to W. Haking Enterprises Limited, Hong Kong, Hong Kong

Filed Mar. 21, 1983, Ser. No. 477,248

Int. Cl.³ G03B *9/40*

U.S. Cl. 354—234.1 **6 Claims**



1. An electronic shutter mechanism for a still camera having manually operable shutter operating means, said mechanism comprising, in combination: shutter blade means including a first magnetic coupling means carried by said shutter blade means; first biasing means for urging said shutter blade means into an initial lens aperture closing position; initially latched actuating means for moving said shutter blade means from said initial to a lens aperture exposing position, said actuating means carrying a second magnetic coupling means controllably releasably engageable with said first magnetic coupling means, one of said first and second magnetic coupling means including a normally energized solenoid coil and the other including an armature attracted by the initially energized solenoid coil so that said shutter blade means moves with said actuating means until the coil is de-energized; second biasing means for urging said actuating means when unlatched into a lens aperture opening position where the actuating means will move said shutter blade means to said lens aperture opening position against the return force of said first biasing means; means for initially energizing said solenoid coil so that said shutter blade means is attracted and is connected with said actuating means until the solenoid is de-energized; timing means responsive to the unlatching of said actuating means for becoming operative to establish a timing period after which period said solenoid coil is de-energized so that said shutter blade means is pulled away from said actuating means by said first biasing means quickly to move said shutter blade means to said lens aperture closing position; and means responsive to operation of said shutter operating means for unlatching said actuating means.

4,505,564

ROTATION CONTROL MECHANISM FOR DIAPHRAM-OPERATING RING IN INTERCHANGEABLE OBJECTIVE FOR PHOTOGRAPHIC CAMERA

Etsuro Nishio, and Zenichi Okura, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 520,724

Claims priority, application Japan, Aug. 16, 1982, 57-123842[U]

Int. Cl.³ G03B *9/02*

U.S. Cl. 354—270 **6 Claims**

1. An interchangeable objective with a variable lens aperture for a camera comprising:

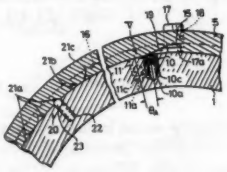
a stationary support member;

a diaphragm-operating member rotatable about an axis be-

tween first and second angular positions relative to the stationary support member;

a first spring loaded locking pin located in the stationary member in a first plane perpendicular to the axis;

a second spring loaded locking pin located in the stationary member circumferentially spaced at an angle with the first pin about the axis and in a second plane perpendicular to the axis, the second plane being spaced from the first plane in the direction of the axis;



a locking groove formed in the diaphragm-operating member so as alternatively to receive the first and second locking pins in locking engagement when the diaphragm-operating member is positioned at the first and second angular positions, respectively; and

an unlocking button mounted in the diaphragm-operating member over the locking groove to push the respective first and second pins out of engagement with the locking groove upon depression of the unlocking button.

4,505,565

DEVICE FOR DETECTING AGING OF DEVELOPER FOR AUTOMATIC FILM DEVELOPING APPARATUS

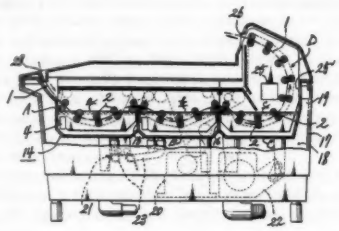
Hiroshi Tanaka, 29-20, Tenjincho-1-chome, Takatsuki-shi, Osaka, Japan

Filed Dec. 16, 1982, Ser. No. 450,550

Claims priority, application Japan, Dec. 22, 1981, 56-208755; Dec. 22, 1981, 56-208756

Int. Cl.³ G03D *3/08*

U.S. Cl. 354—299 **3 Claims**



1. In an apparatus for automatically continuously developing an exposed web of photosensitive material by passing said material through a developer with use of feed rollers, a device for detecting aging of said developer comprising a potential difference generator including an electrode which is inactive to the developer for measuring a potential difference between said developer and another electrode, said another electrode being immersed in said developer, a potential difference amplifier having inputs which are connected to said difference generator for amplifying said potential difference, and a meter connected to an output of said amplifier via a meter driving amplifier for indicating an oxidation reduction potential of said developer, said oxidation reduction potential corresponding to said measured potential difference and related to said ageing of said developer.

4,505,566

RANGE FOCUSING SYSTEM FOR A CAMERA

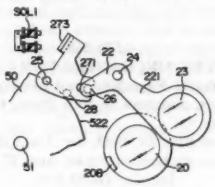
Michihiro Noguchi, Akishima, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,358

Claims priority, application Japan, Feb. 16, 1983, 58-25093

Int. Cl.³ G03B *13/18*

U.S. Cl. 354—400 **4 Claims**



1. A camera provided with a fixed focusing lens as a main photographic lens comprising:

a range finder set at two distances;

an attachment lens for short range photography;

an oscillating lever provided with said attachment lens;

a cam gear which is rotated one turn on a release signal and which gear disposes said attachment lens in front of said main photographic lens by oscillating said lever during its one turn; and a holding mechanism to hold the oscillating lever in the state where the attachment lens is in front of the main photographic lens when a short range signal is issued from the range finder.

4,505,567

ELECTROMAGNETICALLY DRIVEN SHUTTER WITH FOCUS ADJUSTING FUNCTION

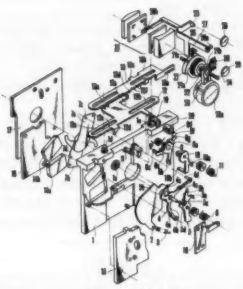
Michio Hirohata, and Takanori Kodaira, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,910

Claims priority, application Japan, Mar. 20, 1982, 57-43716; Mar. 20, 1982, 57-43717

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—403 **8 Claims**



1. An electromagnetically driven shutter comprising:

(a) a coil, means for producing a magnetic field, a rotor driven by an electromagnetic force exerted on said coil arranged in the magnetic field;

(b) focus adjusting means for performing a focus adjusting operation with focusing movement in a predetermined direction;

(c) latch means for latching said focus adjusting means, said latch means when moved from a first position to a second position being arranged for releasing said focus adjusting

means from a latching connection, and when moved from the second position to a third position latching said focus adjusting means again; and

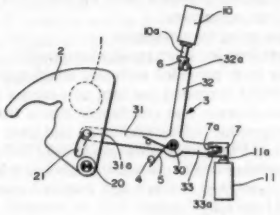
(d) holding means capable of holding said latch means in the first and second positions, said holding means being arranged for releasing the hold on said latch means in response to forward movement of said rotor, and for holding said latch means in the second position in response to termination of a first reciprocating motion of said rotor.

4,505,568

SHUTTER MECHANISM FOR CAMERA

Seiji Asano; Takashi Kagechika, and Minoru Ishiguro, all of Saitama, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Aug. 23, 1983, Ser. No. 525,817
Claims priority, application Japan, Aug. 27, 1982, 57-148881
Int. Cl.³ G03B *9/08*
U.S. Cl. 354—458 **8 Claims**



1. A shutter mechanism of the type having at least a shutter blade movable between a blocking and an unblocking position, said shutter mechanism comprising:

a biasing spring for urging said shutter blade toward said unblocking position;

first electromagnetic means for holding said shutter in said blocking position which, upon the energization thereof, permits said shutter blade urged by said biasing spring to move to said unblocking position;

second electromagnetic means for returning said shutter blade in the course of said movement thereof to said blocking position; and

control means for controlling the energization of said first and second electromagnetic means, said control means performing the following steps in order:

(1) energizing said first electromagnetic means in response to a shutter release operation;

(2) energizing said second electromagnetic means upon receiving a signal for terminating exposure;

(3) deenergizing said first electromagnetic means after said energization of said second electromagnetic means; and

(4) deenergizing said second electromagnetic means after said deenergization of said first electromagnetic means.

4,505,569

PROJECTION APPARATUS WHICH COMPENSATES FOR THE SPECTRAL SENSITIVITY OF AN IMAGE RECEIVING MEMBER

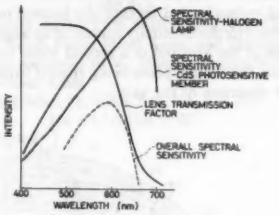
Susumu Seto, Odawara, and Akihiko Toriumi, Kaisei, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 405,862, Aug. 6, 1982, abandoned. This application May 1, 1984, Ser. No. 606,843
Claims priority, application Japan, Aug. 8, 1981, 56-124210
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **12 Claims**

1. Apparatus for projecting an image of an object on a CdS system photosensitive member, said apparatus comprising:

means for illuminating said object; and

image-forming means disposed in the optical path between said illumination means and said photosensitive member,



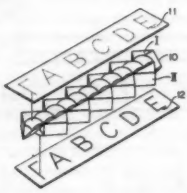
said image-forming means including at least one lens whose spectral transmission factor is high in the wavelength region ranging from 400 nm to 600 nm but sharply drops in the wavelength region ranging from 600 nm to 800 nm.

4,505,570

IMAGE-FORMING OPTICAL SYSTEM

Toshiyuki Inokuchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 19, 1982, Ser. No. 442,961
Claims priority, application Japan, Nov. 18, 1981, 56-184845
Int. Cl.³ G03G *15/04*
U.S. Cl. 355—3 R **8 Claims**



1. A small-size image formation apparatus comprising two types of a plurality of prism lenses and which includes first and second prism lenses which are reversely formed, in mirror-image fashion, each prism having an upper curved surface on an upper light incident surface thereof, and a lower curved surface on a lower light emergent surface thereof, with said prism lenses being combined so as to face each other in the form of a prism lens array which are relatively shifted by a half period in phase and wherein each of said lenses further comprises a first rectangular prism, a second and third rectangular prism formed on a base portion of said first rectangular prism such that the base of one of said second and third rectangular prisms is directed downwards while base portion of the remaining prism is directed upwards with respect to said base of said first rectangular prism, a lens formed on an upper surface of said second rectangular prism and a lens formed on a lower surface portion of said third rectangular prism.

4,505,571
COPY PAPER SUPPLY SYSTEM FOR A TRANSFER TYPE ELECTROSTATIC COPYING APPARATUS

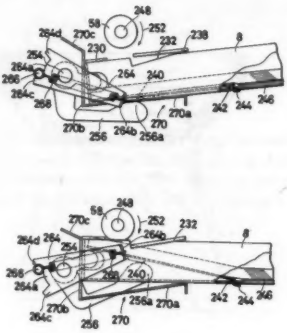
Hiroshi Kimura, Osaka; Masahiko Hisajima, Hyogo-ken, and Yutaka Shigemura, Hyogo-ken, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Division of Ser. No. 85,518, Oct. 17, 1979, Pat. No. 4,345,934. This application Jun. 15, 1982, Ser. No. 388,731

Claims priority, application Japan, Nov. 2, 1978, 53-135331; Dec. 31, 1978, 53-182460; Dec. 31, 1978, 53-182461; Dec. 31, 1978, 53-182462; Jul. 3, 1979, 54-84540; Jul. 3, 1979, 54-92103

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 SH **2 Claims**



1. In a copy paper supply system for use in a transfer type electrostatic copying apparatus and including spaced walls of a housing of the apparatus and a receiving member mounted between said spaced walls, the improvement wherein said system comprises:

a cassette adapted to be inserted into and withdrawn from said receiving member mounted between said spaced walls, said cassette having a bottom, an open top, spaced opposite side walls, and spaced front and rear walls, said bottom in a forward end portion thereof an opening;

a mounting plate positioned within said cassette for supporting a stack of copy paper sheets which are to be fed singly from said cassette along a copy paper path, said mounting plate having a trailing edge, with respect to said copy paper path, pivotally mounted to said bottom about an axis extending in a direction transverse to said copy paper path, said mounting plate having depending from a forward portion thereof a projection at a position to align with said opening;

said cassette including a pair of claws for contacting forward portions of a topmost copy paper sheet, said claws being equally spaced from said projection on opposite sides thereof;

a copy paper feeding shaft rotatably mounted in said spaced walls of the housing at a fixed position above said cassette, said shaft having spaced along the length thereof plural feeding rollers fixed to said shaft;

a push up shaft pivotally journalled in said spaced walls of the housing, said push up shaft having fixed thereto a push up member for, upon pivotal movement of said push up shaft, movement between a feeding position, whereat said push up member extends upwardly through said opening into contact with said projection and pivots said mounting plate upwardly about said axis with respect to said cassette bottom and pivots a forward portion of said cassette upwardly with respect to said receiving member, thereby pressing the topmost copy paper sheet against said feeding rollers, and a non-feeding position, whereat said mounting plate rests on said bottom, said forward portion of said cassette is pivoted downwardly with respect to said receiving member, and the topmost copy paper sheet is spaced from said feeding rollers;

support projection means depending from a trailing portion of said mounting plate for, when said mounting plate is pivoted upwardly with respect to said cassette bottom, balancing the pressure of contact of the topmost copy paper sheet against said feeding rollers; and

means for, when said forward portion of said cassette is pivoted upwardly with respect to said receiving member, limiting the extent of such pivoting and preventing rearward movement of said cassette, said means comprising wedge-shaped notches formed in upper edges of said side walls of said cassette at said forward portion thereof, and retaining plates extending from said spaced walls of the housing, said retaining plates being received in said notches when said forward portion of said cassette is pivoted upwardly.

4,505,572
ELECTROSTATIC REPRODUCING APPARATUS

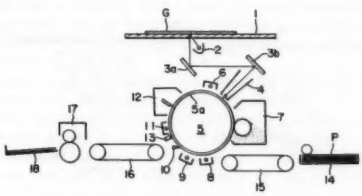
Hisashi Ashida, Tokyo, and Keiichiro Suzuki, Kanagawa, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,343

Claims priority, application Japan, Oct. 30, 1981, 56-172811; Oct. 30, 1981, 56-172812; Oct. 30, 1981, 56-172813

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **8 Claims**



1. An electrostatic reproducing apparatus comprising a photosensitive member having a surface which moves orbitally to carry points thereon successively past a position where a recording paper is separated from said surface and a position at which a cleaning member acts upon the photosensitive member, characterized by: a light-emitting element near said surface of the photosensitive member for emitting a visible light to said surface as it moves between said positions, and a light receiving element for receiving light from said light emitting element that is reflected from said surface to thereby detect jamming.

4,505,573
TONER CHARGING APPARATUS CONTAINING WEAR RESISTANT COATINGS

Grace T. Brewington, Fairport; Steven B. Bolte, Rochester; Dan Hays, Fairport, and William H. Wayman, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

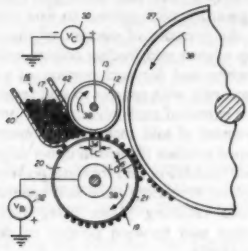
Filed Feb. 10, 1983, Ser. No. 465,361

Int. Cl.³ G03G *15/06*

U.S. Cl. 355—3 DD **17 Claims**

1. An apparatus for charging insulating toner particles comprised in operative relationship of a charging zone situated between a moving means for charging the toner particles and a moving means for transporting the toner particles, said means for charging and said means for transporting biased to a prede-

termined potential, wherein the transporting means contains as a coating a mixture of a fluoropolymer and conductive particulate particles, and wherein substantially uncharged toner particles are introduced into the charging zone.

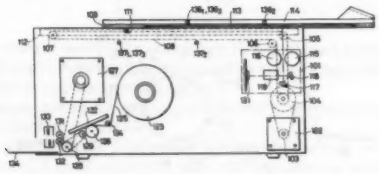


4,505,574

COPYING MACHINE

Masami Kurata; Hiroyuki Saitoh, and Masakane Matsuda, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1983, Ser. No. 474,258
Claims priority, application Japan, Mar. 11, 1982, 57-37287
Int. Cl.³ G03G *15/00*; G03B *27/52, 27/34, 29/00*
U.S. Cl. 355—14 E **9 Claims**



1. A copying machine, comprising:
a transparent platen for the placement of an original;
a platen cover for holding said original on said platen;
sensors for detecting, at positions corresponding to predetermined points on said platen, whether or not light is transmitted between said platen and said platen cover;
logic means for identifying the size of said original on said platen from the outputs of said sensors;
scanning control means for determining a scanning size for said original according to a size identification result provided by said logic means; and
recording sheet size control means for determining a cutting position of an elongated recording sheet according to said size identification result.

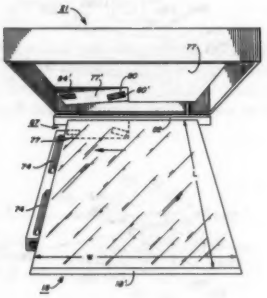
4,505,575

NON-IMAGE ERASE SYSTEM FOR REPRODUCTION MACHINES

Stephen A. J. Palumbo, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1983, Ser. No. 526,923
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 E **6 Claims**

1. In a reproduction machine, the combination of:
(a) a movable photoreceptor providing an imaging area of predetermined size;
(b) means for charging said photoreceptor in preparation for imaging;
(c) a platen for supporting a document to be copied;
(d) lamp means for exposing said platen and the document thereon;
(e) optical means for optically coupling said platen with said photoreceptor so that on actuation of said lamp means, the document on said platen is exposed and a latent electrostatic image of said document is created on said photoreceptor for development and transfer to a copy sheet,
(f) reduction means for adjusting said optical means to permit the size of the latent image created on said photoreceptor to be changed;
(g) first and second erase means for discharging any non-image area of said photoreceptor when said latent image is smaller than said imaging area,



said first erase means comprising a reflective cover for covering said platen and the document thereon, said cover reflecting light from said lamp means striking said cover onto said photoreceptor for discharging said non-image area;
said second erase means exposing said photoreceptor to discharge said non-image area; and
(h) control means for controlling said first and second erase means to erase said non-image area, said control means inhibiting operation of said second erase means when said first erase means cover is closed,
said control means enabling operation of said second erase means when said first erase means cover is open or when said first erase means cover is closed and said latent image is changed by said reduction means.

4,505,576

SYSTEM FOR STORAGE AND PRINTING A PLURALITY OF IMAGES

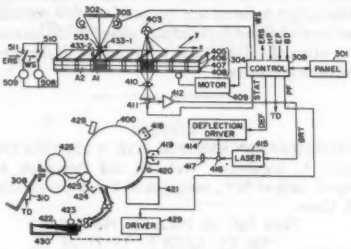
Susumu Sugiura, Yamato; Tadashi Sato, Kokubunji, and Norio Nakajima, Hachiohji, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 390,025, Jun. 18, 1982, abandoned, which is a continuation of Ser. No. 201,537, Oct. 28, 1980, abandoned. This application Mar. 7, 1984, Ser. No. 586,646
Claims priority, application Japan, Oct. 30, 1979, 54-140783
Int. Cl.³ G03G *15/00, 15/04*
U.S. Cl. 355—14 R **4 Claims**

1. An image processing system comprising:
image memory means;
memorizing and reading means for causing a plurality of original images to be stored in said image memory means and for reading out the original images from said image memory means;
input means for entering data for addressing a desired one of the original images stored in said image memory means;
data memory means for storing the data entered by said input means, said data memory means being capable of storing, before the operation of said memorizing and reading means, a first data for addressing a first image and a

second data for addressing a second image in said image memory means; and

control means for controlling said memorizing and reading



means in accordance with data stored in said data memory means so as to read out the desired first document image in accordance with said first data and second document image in accordance with said second data.

4,505,577

TONER POWDER COLLECTION DEVICE

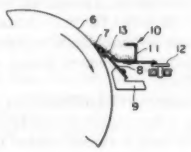
Yutaka Koizumi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Mar. 11, 1983, Ser. No. 474,551

Claims priority, application Japan, Mar. 15, 1982, 57-40458; Apr. 7, 1982, 57-57664; May 13, 1982, 57-80746

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—15 **14 Claims**



1. A toner powder collection system for collecting the toner powder remaining on and removed from an image forming surface, on which an electrostatic latent image is formed and developed by toner powder, to a desired place, comprising:

transporting means for transporting said toner powder along a predetermined path;

transferring means for transferring said toner powder removed from said image forming surface to said transporting means; and

oscillating means for oscillating said transporting means such that said transporting means moves faster when it moves in the transporting direction of said toner powder along said predetermined path thereby causing a substantial slippage between said toner powder and said transporting means to effectively move said toner powder along said predetermined path in the transporting direction.

4,505,578

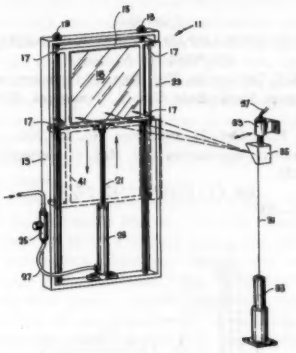
BRAKED GRAVITY TRANSPORT FOR LASER READING AND WRITING SYSTEMS

Balasubramanian N., Saratoga, Calif., assignor to Digital Optics Corporation, Sunnyvale, Calif.

Filed Nov. 14, 1983, Ser. No. 551,266

Int. Cl.³ G03B *27/32*; H04N *5/84*

U.S. Cl. 355—43 **38 Claims**



1. A transport for moving photosensitive media relative to a beam in a laser reading and writing system comprising,

a carriage associated with a mass, the carriage mounted for motion propelled by the mass falling in the earth's gravitational field, said carriage moving along a predefined path, pulled by the mass,

braking means connected to the mass for braking the falling motion of the mass to a uniform velocity,

a laser having optical means for scanning in a line, transverse to the direction of motion of the carriage, and

a photosensitive medium disposed to receive said scanning line from the laser, either the laser or said photosensitive medium mounted on said carriage, the other mounted in a fixed position in optical communication with the first.

4,505,579

VARIABLE MAGNIFICATION COPYING MACHINE

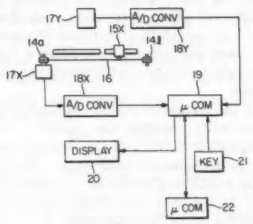
Katsushi Furuichi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1982, Ser. No. 410,073

Claims priority, application Japan, Aug. 26, 1981, 56-134447; Sep. 26, 1981, 56-152300; Sep. 28, 1981, 56-153419

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—55 **19 Claims**



1. A variable magnfication copying machine comprising:

original size input means for inputting a size of an original;

paper size input means for inputting a size of a copy paer; and

determination means for determining a magnification factor based on the original size and the paper size, said determi-

nation means including first determination means for determining a first magnification factor based on first direction widths of the original and the paper, second determination means for determination a second magnification factor based on second direction widths of the original and the paper, and selection means for selecting between said first determination means and said second determination means.

4,505,580

METHOD AND APPARATUS FOR GENERATING EXPOSURE MASKS

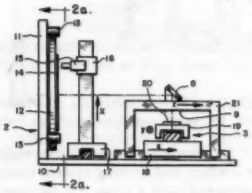
Dieter Michel, Traunstein, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Oct. 21, 1982, Ser. No. 435,705

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142025

Int. Cl.³ G03B *27/42, 27/52*

U.S. Cl. 355—53 **13 Claims**



1. A process for generating exposure masks for the production of a high resolution recording medium, said process comprising the following steps:

(a) providing an exposure system comprising:

first means for successively holding a plurality of recording originals in place;

second means for holding a recording substrate for an exposure mask to be generated in place;

means for projecting a respective reduced size image of each of the recording originals onto the recording substrate, and

a computer programmed to generate a plurality of commanded position signals based on an actual position of each of the recording originals and a nominal position of the respective reduced size image of the respective recording original on the recording substrate;

(b) mounting a first recording original in the first means and a recording substrate in the second means;

(c) storing in the computer a plurality of nominal coordinate values and measured actual coordinate values of the first recording original and operating the computer (1) to correct for differences between the nominal angular orientation and the actual angular orientation of the first recording original, (2) to determine a suitable scale reduction, and (3) to calculate in response thereto a plurality of position values indicative of the desired relative position of the recording substrate with respect to the first recording original;

(d) operating the computer on the calculated position values to automatically generate the plurality of commanded position signals indicative of the desired relative position of the recording substrate with respect to the first recording original which is effective to reproduce a first reduced size image of the first recording original at the desired position on the recording substrate;

(e) adjusting the relative position of the recording substrate with respect to the first recording original in accordance with the commanded position signals;

(f) reproducing a reduced size image of the first recording original at the desired position on the recording substrate; and then

(g) mounting at least a second recording original in the first means and repeating steps (c) through (e) with at least the second recording original to utilize the exposure system to reproduce at least a second reduced size image on the recording substrate at a predetermined position with respect to the first reduced size image in order to generate at least a first reduced size image of the first recording original and a second reduced size image of the second recording original adjusted one with respect to the other on the recording substrate.

4,505,581

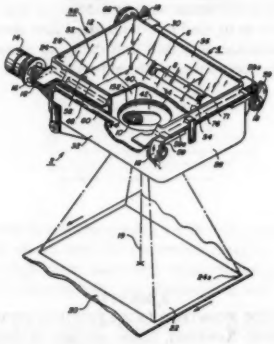
REGISTRATION SYSTEM FOR A PHOTOCOPIER

Frederick A. Seedhouse, Webster, and Frederick A. Green, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1982, Ser. No. 372,582

Int. Cl.³ G03B *27/36, 27/38*

U.S. Cl. 355—58 **2 Claims**



1. In a full-frame, corner registered flash illumination and imaging optical system for a photocopier, the combination of:

a movable platen member for supporting original documents to be copied;

an enclosed illumination housing positioned beneath said platen member and containing flash illumination means for substantially uniformly illuminating the underside of said platen, said housing further containing a movably mounted, relative illumination compensated projection lens, for projecting document images onto a photosensitive image plane;

means for changing the magnification of said optical system and including a first means for vertically translating said platen member and a second means for translating said projection lens along a non-linear path, said second means including:

a lens carriage assembly having said projection lens mounted thereon;

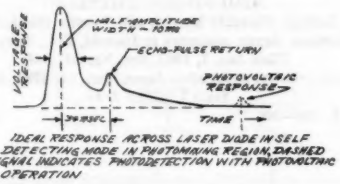
means for providing a vertical linear component of motion to said carriage assembly;

means for providing a horizontal non-linear component of motion to said carriage assembly said means including a horizontally movable upper plate assembly forming part of the lens carriage assembly in which said projection lens is mounted, said plate assembly having a single cam follower element projecting therefrom, which cooperates with a single cam member to define a non-linear path of travel for said lens, whereby the sum of said vertical and horizontal components of motion define a non-linear path at any point along which the lens carriage and hence the projection lens are in the required position to project corner-registered images at the selected magnification onto the imaging plane.

4,505,582
SELF-DETECTING OPTICAL SENSORS

Rainer Zuleeg, San Juan Capistrano, and Johannes K. Notthoff, Lomita, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 14, 1982, Ser. No. 398,134
Int. Cl.³ G01C 3/08; H01S 3/00
U.S. Cl. 356—5 **4 Claims**



IDEAL RESPONSE ACROSS LASER DIODE IN SELF DETECTING MODE IN PHOTOMIXING REGION, DASHED SIGNAL INDICATES PHOTODETECTION WITH PHOTOVOLTAIC OPERATION

1. A short distance laser ranging system comprising:

means for lasing, said means for lasing outputting radiant energy in response to a driver pulse and homodyning with return energy reflected off a target, said lasing means receiving said return energy and amplifying said return energy, said return energy being received by said lasing means during a dead-time plateau period, said lasing means outputting a return energy signal,

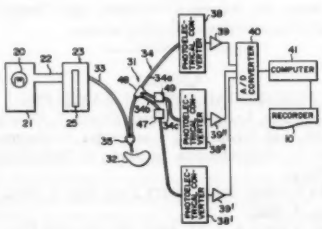
means for driving said lasing means, said means for driving substantially eliminating a dead-time plateau of said lasing means whereby said return energy is homodyned, said means for driving including means for generating a drive pulse signal in response to a trigger pulse and means for generating said driver pulse in response to said drive pulse signal from said means for generating a drive pulse signal, said driver pulse driving said lasing means to emit radiant energy, and

means for outputting a time signal, said means for outputting reflecting the time duration between outputting said radiant energy and the reception of said return energy, said time signal being representative of the range between said target and said lasing means.

4,505,583
SPECTROSCOPIC ANALYZER SYSTEM FOR EXAMINING INTRAVITAL TISSUE

Masaaki Konomi, 1-11-203, Sakurajosui 4-chome, Setagaya-ku, Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 363,855
Claims priority, application Japan, Apr. 10, 1981, 56-53150; Jul. 2, 1981, 56-102289
Int. Cl.³ G01N 21/27, 21/64
U.S. Cl. 356—73 **8 Claims**



1. A spectroscopic analyzer system for examining intravital tissues, comprising:

a light source having a predetermined range of wavelength;

spectroscopic means including a plurality of sets of interference filters for two-wavelength photometry and adapted to be operated for producing sequentially on a time series base a plurality of light rays of different wavelengths from said light source;

a first light conductor from transmitting sequentially the plurality of light rays of different wavelengths to an object under analysis;

a second light conductor for sequentially receiving the plurality of modulated light rays reflected from or transmitted through said object and transmitting the modulated light rays to photoelectric converter means for converting the light rays into corresponding electric signals;

means for digitalizing said electric signals; and

digital processing means for storing said digital signals and executing arithmetic operation on the digital signals in a manner that noises are eliminated to obtain a plurality of time series data corresponding to each set of the interference filters;

said spectroscopic means comprising a light chopper constituted by a rotatable disc adapted to be rotated at a predetermined speed by a driving means, and said plurality of the interference filters are, respectively, mounted in a plurality of through-holes formed in said rotatable disc in a peripheral portion thereof in a circular array with adjacent ones of said interference filters being spaced by a substantially same distance from one another, said rotatable disc being so positioned relative to an optical path of light emitted by said light source that said optical path is intermittently and successively intercepted by said interference filters, and said first light conductor has an inlet end disposed in succession to said light chopper so as to receive light rays produced by said interference filters successively on a time division base, said first light conductor being constituted by a bundle of optical fibers;

an interference filter for fluorescence excitation is additionally provided in said disc in circular alignment with said interference filters for the two-wavelengths photometry;

a third light conductor is branched from said second light conductor and optically coupled to second photoelectric converter means by way of an interposed fluorescence selecting filter, said means being connected to said digitizing means;

a fourth light conductor is branched from said second light conductor and optically coupled to a third photoelectric converter means by way of an interposed fluorescence selecting filter, said photoelectric converter means being connected to said digitizing means.

4,505,584
METHOD AND APPARATUS FOR DETECTING FOCUSSING ERROR SIGNAL OF OBJECTIVE LENS

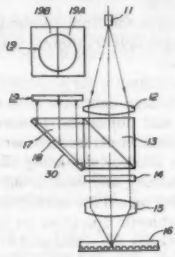
Kiichi Kato; Tohru Musha, and Kenichi Ito, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd.

Filed Jan. 15, 1982, Ser. No. 339,718
Claims priority, application Japan, Jan. 22, 1981, 56-7143; May 1, 1981, 56-65288
Int. Cl.³ G01J 1/36
U.S. Cl. 356—123 **28 Claims**

1. A method of producing a focussing error signal of an objective lens with respect to an object on which a light beam is to be focussed by the objective lens, comprising:

introducing at least a part of the light beam reflected by the object into a prism and then into a boundary surface between a thin film which is applied to the prism and the air at an incident angle substantially equal to a critical angle of total reflection, the thin film having a refractive index different from that of the prism so as to increase reflection factor variation between the critical angle of total reflec-

tion and angles of incidence very close to such critical angle; and



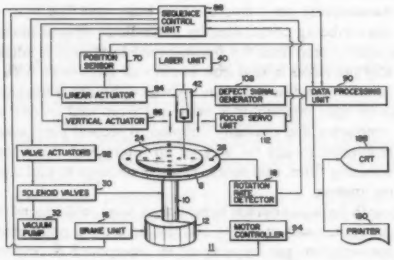
detecting the light beam reflected by said boundary surface to derive the focussing error signal.

4,505,585

SYSTEM FOR DETECTING DEFECTS ON AN OPTICAL SURFACE

Shoji Yoshikawa; Ken Ohshima; Hiroshi Kodama; Kunio Yamamiya; Masaharu Sakamoto, and Kiichi Kato, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,680
Claims priority, application Japan, Mar. 31, 1981, 56-48006
Int. Cl.³ G01N *21/32*; G06F *15/20*; G01B *11/30*
U.S. Cl. 356—237 **9 Claims**



1. A system for detecting defects on an optically flat surface of an object to be inspected, comprising:

a turntable having a surface on which the object is mounted;

means for rotating said turntable;

means for generating a laser beam;

an optical unit for projecting said generated laser beam onto said optically flat surface of the object and directing the laser beam reflected from said optically flat surface in a predetermined direction, said optical unit including an objective lens for converging the laser beam, and means for always locating the focal point of the objective lens on said pivotally flat surface of the object;

means for converting the reflected laser beam directed by said optical unit into a photo-electric signal;

means for moving said optical unit relative to said turntable in a radial direction of said turntable;

means responsive to the position of said object and for generating a position signal depending on the position of said object onto which said laser beam is projected;

means responsive to said photo-electric signal and for generating a defect signal as a function of said photoelectric signal;

means responsive to the duration of said defect signal for detecting the length of a detected defect in said optically flat surface of said object being inspected;

means responsive to said position signal for generating addresses as a function of said position signal, said address generating means including memory means having a number of memory locations for storing said defect signals in the locations designated by the generated addresses; and

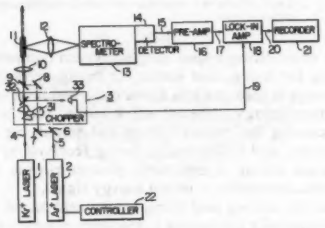
means for activating the aforesaid respective means in a predetermined sequence.

4,505,586

LASER RAMAN SPECTROPHOTOMETRY SYSTEM AND ADJUSTMENT THEREOF

Kenji Tochigi; Yoshiaki Hanyu, and Yutaka Hiratsuka, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 7, 1982, Ser. No. 337,818
Claims priority, application Japan, Jan. 14, 1981, 56-3047
Int. Cl.³ G01J *3/44*
U.S. Cl. 356—301 **10 Claims**



1. A laser Raman or Brillouin spectrophotometry system, comprising:

a first laser source for emitting a first laser beam of a first wavelength;

a second laser source for emitting a second laser beam of a second wavelength different from said first wavelength;

first optical means for alternately and periodically transmitting said first and second laser beams at a predetermined frequency and directing the first and second laser beams along a substantially same path to a specimen to be measured, said first optical means including reference signal means for generating a reference electrical signal having said predetermined frequency and a constant phase relation with said alternately transmitted first and second laser beams;

second optical means for detecting a light signal generated from the specimen and converting the light signal into an electrical signal; and

phase-sensitive detecting means for phase-sensitively detecting the electrical signal at said predetermined frequency to detect a different signal essentially formed by subtracting a signal component corresponding to said second laser beam from a signal component corresponding to said first laser beam, the reference electrical signal being supplied to said phase-sensitive detecting means.

4,505,587

PICOSECOND OPTICAL SAMPLING

Hermann A. Haus, Lexington, Mass.; Steven T. Kirsch, Sunnyvale, Calif., and Frederick J. Leonberger, Lexington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

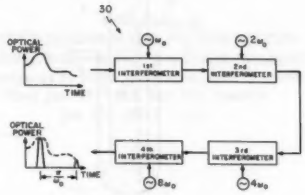
PCT No. PCT/US81/01086, § 371 Date Aug. 4, 1982, § 102(e) Date Aug. 4, 1982
PCT Filed Aug. 14, 1981, Ser. No. 425,130
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—345 **6 Claims**

1. An ultra-short optical pulse generator comprising:

(a) a source of optical radiation;

(b) a plurality of waveguide interferometers, each interfer-

ometer having an input to receive said radiation, at least two branches in which said optical radiation diverges, and an output in which the divergent radiation is recombined, the plurality of waveguide interferometers being connected to each other to define a first interferometer and a series of subsequent interferometers in cascade arrangement; and



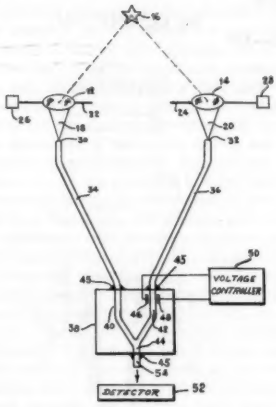
(c) a plurality of field means, each field means coupled to one of the interferometers to modulate the phase-matching conditions at its output, whereby upon modulation of the first interferometer at a particular frequency and further modulation of the subsequent interferometers at progressively higher harmonic frequencies, ultra-short pulses of radiation are produced when phase-matching occurs.

4,505,588

FIBER STELLAR INTERFEROMETER

Jacques E. Ludman, 98 Old Lowell Rd., Westford, 01886; John L. Sampson, 8 Bedford St., Lexington, 02173, and Henry J. Caulfield, 385 Old Beaverbrook, Nagog Woods, all of Mass. 01718

Filed Feb. 9, 1983, Ser. No. 465,215
Int. Cl.³ G01B 9/02
U.S. Cl. 356—354 **10 Claims**



1. An optical fiber stellar interferometer comprising:

means for receiving an output of electromagnetic radiation emanating from a source, said receiving means focusing electromagnetic radiation derived from one location in said electromagnetic radiation into a first beam of electromagnetic radiation focused to a first preselected point and focusing electromagnetic radiation derived from another location in said electromagnetic radiation into a second beam of electromagnetic radiation focused to a second preselected point;

means optically aligned with said first beam and said second beam of electromagnetic radiation for receiving said first and said second beams of electromagnetic radiation and passing therethrough only a single mode from each of said beams of electromagnetic radiation;

means optically aligned with said single mode passing means for defining a first beam path and second beam path and for combining said first and second beam paths into a single output beam path whereby said first beam of electromagnetic radiation having only a single mode follows said first beam path and said second beam of electromagnetic radiation having only a single mode follows said second beam path prior to combining into a single output beam of electromagnetic radiation following said output beam path;

means operably associated with only one of said first or said second beam paths for altering the phase of said beam of electromagnetic radiation following said one beam path prior to said first and second beams combining into said single output beam following said output beam path; and

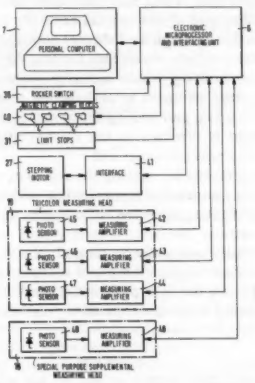
means optically aligned with said output beam path of said beam path defining means for receiving said single output beam and detecting varying intensities of said single output beam of electromagnetic radiation whereby said varying intensities can be utilized to determine the size and shape of said source of electromagnetic radiation by stellar intensity interferometer techniques.

4,505,589

PROCESS AND APPARATUS FOR THE COLORIMETRIC ANALYSIS OF PRINTED MATERIAL

Hans Ott; Rolf Boegli, both of Regensdorf; Ulrich Birch, Wallisellen, all of Switzerland; Helmut Kipphan, Schwetzingen, and Gerhard Löffler, Walldorf, both of Fed. Rep. of Germany, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Mar. 30, 1982, Ser. No. 363,538
Claims priority, application Switzerland, Apr. 3, 1981, 2283/81
Int. Cl.³ G01J 3/50
U.S. Cl. 356—402 **31 Claims**



1. A process for the colorimetric analysis of a printed color measuring strip by means of a scanning densitometer, the measuring head of which is guided along the measuring strip to be analyzed, thereby generating a plurality of color density values representing the color properties of the measuring strip, with said color density values being evaluated automatically for the recognition of the measuring fields of the color measuring strip and for the correlation of the color density values with the measuring fields, the process including the steps of guiding the measuring head along the color measuring strip in a recognition run, thereby scanning each measuring field in a multitude of scanning points so as to produce a multitude of color density

values and determining from this multitude of color density values measuring positions suitable for the measuring process itself and further processing essentially only color density values originating in the determined measuring positions.

4,505,590

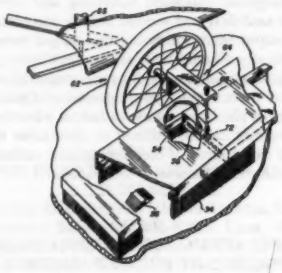
MOBILE TESTING APPARATUS

Sidney A. Heenan, Park Ridge, Ill., assignor to Amerace Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 412,911, Aug. 30, 1982, abandoned. This application Jan. 3, 1983, Ser. No. 455,297

Int. Cl.³ G01N *21/55*

U.S. Cl. 356—445 **16 Claims**



1. A mobile testing apparatus for continuous onsite reflective testing of markers on a roadway, comprising:

an elongated shroud assembly constructed for mounting to an associated vehicle, said shroud assembly constructed to be aligned with the direction of movement of the associated supporting vehicle and generally adjacent a road surface, said shroud assembly including an elongated housing having a leading end and a trailing end; an incident light source and reflected-light receptor mounted to the trailing end of said shroud assembly for directing light to a marker through said shroud assembly and for receiving reflected light therefrom for analysis;

an aperture housing which includes means defining a floating aperture mounted to said shroud assembly intermediate the leading and trailing ends, and through which incident light is directed to the marker and reflected light returns to said receptor; and

positioning means for sensing the roadway surface and substantially continuously positioning said aperture housing and said floating aperture at a constant distance relative to said roadway surface, whereby said aperture remains substantially uniformly positioned relative to the roadway surface if said light source and receptor move vertically, and whereby the light path distance relative to the marker being tested remains substantially uniform.

4,505,591

SOLIDS MIXING WELL STRUCTURE AND METHOD

Roger W. Day, and Charles N. Grichar, both of Houston, Tex., assignors to Geosource Inc., Houston, Tex.

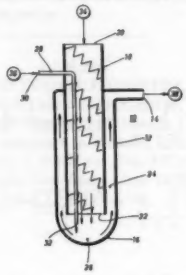
Filed Dec. 20, 1982, Ser. No. 451,175

Int. Cl.³ B01F *15/04*

U.S. Cl. 366—134 **4 Claims**

1. A method for adding in a mixing structure having a mixing region a second material at atmospheric pressure to a relatively high-pressure stream of a first material, said first material having a first specific gravity and being delivered to said mixing region through a first conduit, and said second material having a second specific gravity and being delivered to said mixing region through a second conduit, said first and second materials being mixed to produce a third material having an intermediate pressure and an intermediate specific gravity, said method comprising the steps of:

delivery said first material to said mixing region at a first pre-determined pressure;



delivering said second material to said mixing region at said first pre-determined pressure; and

discharging said third material from said mixing structure at a second pre-determined pressure greater than atmospheric pressure.

4,505,592

APPARATUS FOR PRODUCING A MIXTURE FROM TWO OR MORE PLASTIC COMPONENTS

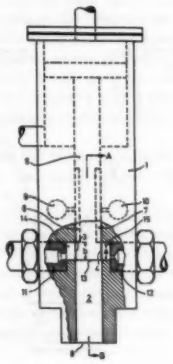
Jörg Ihbe, Gauting; Peter Taubenmann, Munich; Heino Thiele, Ludwigshafen, and Hans-Dieter Zettler, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 547,998

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242278

Int. Cl.³ B01F *5/04*

U.S. Cl. 366—134 **5 Claims**



1. An improved apparatus for producing a mixture from at least two plastic components, said apparatus including a mixing chamber having inlet apertures for the individual plastic components, an outlet for the mixture, recycle lines for each of said plastic components and a control element reciprocable in the mixing chamber across the inlet apertures, said control element having overflow channels to connect said apertures to said recycle lines when said apertures are blocked from said mixing chamber, said improvement comprising:

an end portion of said control element extending beyond said overflow channels in the direction of reciprocation and having a length matching the dimension of said inlet aper-

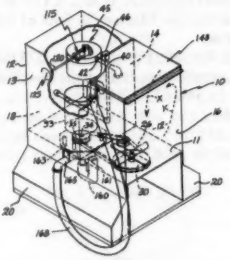
tures measured in the said direction of reciprocation, said end portion having a cross section conforming to the cross section of said mixing chamber, whereby to momentarily cover said apertures and prevent pressure peaks in the plastic components when said control element reciprocates across said apertures.

4,505,593

BATTER MIXER WITH WATER METER

Michael E. Miller, Bellevue, and Fred Fetzer, Strongsville, both of Ohio, assignors to Stein Associates, Inc., Sandusky, Ohio

Filed Jul. 15, 1983, Ser. No. 514,014
Int. Cl.³ B01F *15/02*
U.S. Cl. 366—152 **8 Claims**



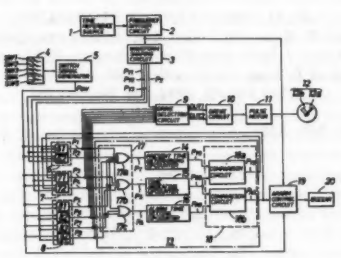
1. A batter mixer for mixing a dry powder batter mix with a predetermined quantity of liquid comprising, a housing having a mixing chamber, means for connecting said chamber to a source of fluid, means in fluid circuit with said connecting means being responsive to the flow of fluid therethrough to accurately measure and to selectively control a selected one of a multitude of different quantities of fluid for flowing into said chamber, said chamber having means for providing ready access to the interior thereof for deposition of dry powder batter mix therein, and mixing means in said chamber for thoroughly mixing said selected quantity of fluid and batter mix, and wherein said mixing chamber is of square configuration in plan and open at the top thereof providing said ready access means for said deposition of batter mix therein and providing for ready cleaning of said chamber, and wherein openable, imperforate cover means are provided to selectively close the open top of said chamber to prevent egress of the mixture of batter mix and fluid therefrom, and wherein said second mentioned means comprises a fluid metering chamber connected in series circuit between the source of fluid and said mixing chamber, said fluid metering chamber being operable to sense the flow of fluid therethrough and to accurately measure the quantity thereof, said fluid metering chamber having means repeatably actuated in response to a preselected quantity of fluid passing therethrough, the last mentioned means comprising a piston element cyclically movable about an axis in said fluid metering chamber and responsive to a predetermined quantity of water passing thrqugh said fluid metering chamber, means connected to the repeatably actuated means being operable to pre-set said actuated means and permit a predetermined quantity of fluid to pass therethrough and into said mixing chamber, and wherein the means connected to the repeatably actuated means comprises shaft means rotatably movable by said actuated means, gear means connectable with said shaft means, and adjustment means connectable to said gear means for pre-setting said gear means and enabling said gear means to be rotated in response to a preselected volume of fluid passing through said metering chamber, stop means connectable to the gear means and in fluid circuit with the source of fluid, and being actuated in response to the passage of a preselected volume of fluid passing into the mixing chamber to stop the fluid flow, said means connectable with said gear means comprising a hub attached to said gear means, cam means resiliently attached to said hub, and valve means operatively connected to said cam means and in fluid circuit between the source of fluid and said mixing chamber, said resilient connection between said hub and said cam means comprising an O-ring encircling said hub and adapted for frictional engagement with the defining interior of a receiving cavity in said cam means and permitting axial movement of said cam means relative to said hub to selectively uncouple and to selectively recouple said cam means from and to said hub but preventing relative rotational movement between said cam means and said hub in the coupled condition of said cam means and said hub, said cam means in said coupled condition of said cam means and said hub being actuatable to operate said valve means in response to a preselected volume of fluid entering into the mixing chamber effective to stop the fluid flow, said valve means of said stop means comprising a poppet valve which is held by said cam means in open condition to permit fluid flow from said metering chamber via said first mentioned means into said mixing chamber, but which automatically moves to closed position when said cam means is rotated by said hub and attached gear means to a position where said poppet valve registers with a recess on the exterior of said cam means, to thus stop the fluid flow from said metering chamber into said mixing chamber.

4,505,594

MULTI-FUNCTION ANALOGUE TYPE WATCH

Hisashi Kawahara; Hiroyuki Kihara, and Masahiro Sase, all of Tanashi, Japan, assignors to Citizen Watch Co. Ltd., Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,486
Claims priority, application Japan, Jul. 26, 1983, 52-135060
Int. Cl.³ G04B *23/02, 19/04*
U.S. Cl. 368—73 **5 Claims**



1. A multi-function analogue type watch comprising:
- a time reference source for generating a time reference signal;
- a frequency divider circuit for dividing the frequency of the time reference signal and providing time signals of predetermined low frequencies;
- a waveform shaping circuit for shaping the waveforms of the time signals into different wave shaped signals;
- a group of exterior operating switches;
- a switch signal generator for generating different switch signals dependent on which said exterior switches are operated;
- a normal time drive control responsive to application of selected switch signals and selected wave-shaped signals for providing normal drive signals for time keeping;
- a function switching control responsive to application of selected switch signals and selected wave-shaped signals for performing a switch from present time to any particular function time;
- a time correction control responsive to application of selected switch signals and selected wave-shaped signals for providing time correction signals;
- a drive selection circuit responsive to application of selected signals from said waveform shaping circuit, time drive control, function switching control and time correction

control for providing drive signals dependent on which exterior switches are actuated;

a drive circuit responsive to application of drive signals for providing hand drive signals;

a motor responsive to application of hand drive signals for rotating; and

hour and minute hands driven by the motor, characterized by:

a first upcounter allotted for measuring present time and for registering a count difference relative to a particular time indicated by the hour and minute hands;

a second upcounter allotted for representing a particular time indicated by the hour and minute hands and for registering a count difference relative to present time or function time;

a third upcounter allotted for determining a particular function time and for registering a count difference relative to a particular time indicated by the hour and minute hands;

an input control circuit for supplying input signals to the first, second and third upcounters;

a first coincidence circuit responsive to coincidence of the output signals from the first and second upcounters for providing a first coincidence signal;

a second coincidence circuit responsive to coincidence of the output signals from the second and the third upcounters for providing a second coincidence signal; and

a hand position controlling circuit responsive to application of the coincidence signals for moving forward or backward the hour and minute hands at a normal or increased speed until the hour and minute hands have indicated a particular time as required.

4,505,595

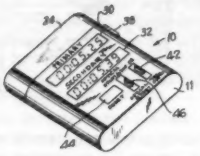
DUAL TIMING EVENT STOPWATCH

Reinhold R. Rose, 10100 Oso Ave., Chatsworth, Calif. 91311; and Lance J. Lieberman, Port Washington, N.Y., assignors to Reinhold R. Rose, Chatsworth, Calif.

Filed Feb. 17, 1984, Ser. No. 581,254

Int. Cl.³ G04F *8/00*

U.S. Cl. 368—110 **14 Claims**



1. A dual timing event stopwatch, comprising:

first timing means for measuring elapsed time between an applied start signal initiating said measurement and a subsequently applied stop signal terminating said elapsed time measurement;

first display means associated with said first timing means for displaying said elapsed time measured between said start and stop signals;

second timing means for measuring elapsed time between an applied start signal initiating said measurement and a subsequently applied stop signal terminating said measurement;

second display means associated with said second timing means for displaying said elapsed time measured thereby;

optical pick-up means for detecting a remote light emission and for generating a signal in response thereto, said optical means being connected to said first timing means for initiating said elapsed time measurement;

switch means connected to said second timing means for providing thereto a measurement initiating start signal on a first actuation of said switch means and a measurement terminating stop signal on a second actuation thereof; and

mode selection means associated with said first timing means and operable for user selection between a first operating mode wherein the stop signal for terminating elapsed time measurement by said first timing means is provided on said second actuation of said switch means, and a second operating mode wherein the stop signal for terminating measurement by the first timing means is provided by said optical pick-up means in response to a remote light emission.

4,505,596

COMPOSABLE WALL-CLOCK

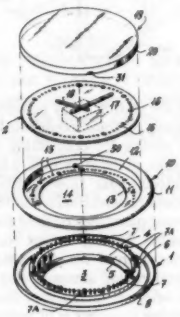
Raul Barbieri, and Giorgio Marianelli, both of Via Faruffini 13, 20149 Milan, Italy

Filed Jan. 30, 1984, Ser. No. 575,029

Claims priority, application Italy, Feb. 11, 1983, 20781/83[U]

Int. Cl.³ G04B *19/06*

U.S. Cl. 368—236 **7 Claims**



1. A wall-clock comprising a dial, hands and a clockwork for the actuation of the latter, wherein the clock includes a first annular component provided with a ring or crown of pin-like parallel projections; a second annular component which can be coupled with the first component and is provided with a ring or crown of openings that can be aligned with and passed through by said projections and located on an inner flange, a substantially flat dial for rest on said flange and provided with a ring or crown of openings that can be aligned with and passed through by said pin-like projections, so that the latter form the time references, and a third transparent component provided with contour side insertable in the second component.

4,505,597

NOVELTY ALARM CLOCK

Jack L. Flinn, Jr., 4440 NW. 19th St., Apt. L-213, Lauderhill, Fla. 33313

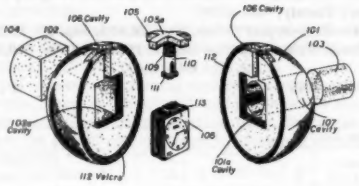
Filed Nov. 28, 1983, Ser. No. 555,346

Int. Cl.³ G04C *21/16*; G04B *23/00*

U.S. Cl. 368—250 **6 Claims**

1. A novelty alarm clock assembly comprising an alarm clock means having an external push-button alarm shut-off and a resilient air-filled flexible casing means surrounding said

clock means; said casing means including a trigger means connected to said alarm shut-off and terminating in a portion of



the exterior of said casing; said casing portion being manipulable so as to permit pushing or pulling on said shut-off.

4,505,598

CASE FOR A CLOCK

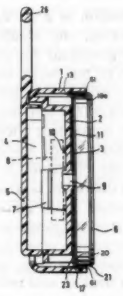
Dieter Wolf, Hattersheim, and Joachim Müller, Offenbach, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 8, 1982, Ser. No. 386,172

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1981, 3146897

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—309 **19 Claims**



1. A case for a clock for moist rooms, comprising

members comprising a hollow cylindrical dome portion and a transparent cover means,

said members have peripheral surfaces, at least portions of said peripheral surfaces of said transparent cover means and said dome portion are spaced from each other defining air circulation passages therebetween,

said hollow cylindrical dome portion having an observer-side opening and a rear side, and said transparent cover means for substantially closing the observer-side opening of the dome portion, said transparent cover means has an interior face and an exterior face,

a back cover substantially closing the rear side of the dome portion,

a support plate provided in the dome portion, said support plate dividing the case including the dome portion, said back cover and said transparent cover means into a plurality of inner case spaces, and said support plate on a side thereof facing away from said cover means being adapted to support a clock movement,

said air circulation passages being uniformly distributed at said peripheral surfaces adjacent said interior face of said cover means and communicating with the outside,

one of the inner case spaces is between the interior face of said transparent cover means and the other side of said support plate which faces said cover means, and

said air circulation passages communicate the outside with said one inner case space for enabling a stream of air to flow through said air circulation passages and to pass along said interior face of said transparent cover means, said one inner case space is adapted to house a dial for the clock movement.

4,505,599

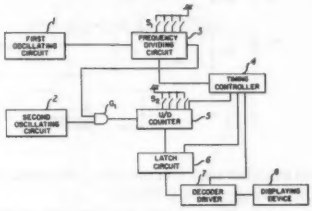
ELECTRONIC CLINICAL THERMOMETER

Kei Nonaka, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed May 6, 1983, Ser. No. 492,419

Int. Cl.³ G01K *7/32*

U.S. Cl. 374—163 **8 Claims**



1. An electronic clinical thermometer comprising in combination: a first oscillating circuit having a first temperature coefficient and operable to produce a first oscillating output signal; a frequency dividing circuit connected to said first oscillating circuit and having a selectively changeable frequency dividing ratio for adjustably frequency dividing the first oscillating output signal; switching means connected to said frequency dividing circuit for selectively changing the dividing frequency thereof; a second oscillating circuit having a second temperature coefficient which differs widely from said first temperature coefficient and operable to produce a second oscillating output signal; an AND gate connected to receive the first and second output signals from said first and second oscillating circuits; a timing controller connected to said frequency dividing circuit; an up/down counter connected to said AND circuit and said timing controller and having a selectively changeable counting frequency; another switching means connected to said up/down counter for selectively changing the counting frequency thereof; a latch circuit connected to said up/down counter and said timing controller; a decoder driver connected to said latch circuit and said timing controller; and a display device connected to said decoder driver.

4,505,600

TEMPERATURE SENSOR

Takashi Suzuki; Tetsuo Kimura, both of Tokyo, and Seiichi Tanaka, Chiba, all of Japan, assignors to Nittan Company, Ltd., Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,391

Claims priority, application Japan, Nov. 18, 1982, 57-201185

Int. Cl.³ G01K *7/00*

U.S. Cl. 374—170 **7 Claims**

1. A temperature sensor, comprising:

a temperature detection section;

a reference voltage generation section;

means for generating a temperature detection signal such that an output from said temperature detection section and an output from said reference voltage generation section are differentially compared and amplified by an operational amplifier;

control circuit means for selectively changing an output characteristic of said operational amplifier relative to the output from the temperature detection section so that the

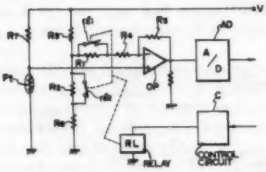
temperature sensor can be employed in a variety of applications requiring different temperature sensing sensitivities or temperature sensing ranges;

said reference voltage generation section comprising a series circuit of first to third resistors; and

said control circuit means comprising

a first switch means connected in parallel with said second resistor for controlling a reference voltage such that the reference voltage is decreased when said first switch means is closed,

a second switch means for controlling a gain of said operational amplifier such that the gain is increased when said second switch means is closed,



a series circuit of fourth and fifth resistors which is connected between said operational amplifier and a connecting point between said first resistor and said second resistor, said fourth resistor being connected in parallel with said second switch means,

a relay means commonly connected to said first and second switch means for controlling said first and second switch means, and

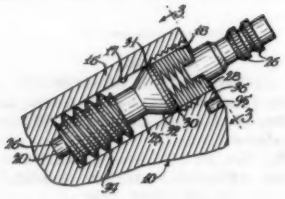
control means for controlling an operation of said relay means.

4,505,601

RETAINER BEARING AND BEARING ASSEMBLY FOR A WINDOW OPERATOR AND ASSEMBLY METHOD AND TOOL

Christopher T. Sandberg, and Eugene L. Mosher, both of Owatonna, Minn., assignors to Truth Incorporated, Owatonna, Minn.

Filed Feb. 16, 1983, Ser. No. 466,879
Int. Cl.³ F16C *35/02*
U.S. Cl. 384—428 **6 Claims**



1. A bearing assembly comprising, a housing having a bore with an internal thread adjacent the outer end thereof, a cylindrical retainer bearing having an external thread threaded into said bore, said retainer bearing having a flat side at an outer end thereof to define a space between said internal thread and the retainer bearing and a spanner wrench slot at an end of said flat side located at a predetermined rotative position in said bore to be laterally adjacent a stake location on the housing, and a localized deformation of the housing at the stake location defined by deformed material positioned in said space and said spanner wrench slot to lock the retainer bearing in position.

4,505,602

METHOD FOR ENCODING IDEOGRAPHIC CHARACTERS

Wyman S. Wong, 1914 Glendora Dr., District Heights, Prince George's County, Md. 20747

Continuation-in-part of Ser. No. 428,692, Sep. 30, 1982, abandoned. This application Sep. 7, 1984, Ser. No. 649,143
Int. Cl.³ B41J *5/00*
U.S. Cl. 400—110 **1 Claim**

NUMERIC CODE	0	1	2	3	4	5	6	7	8	9
STROKE	零	HORIZONTAL 横	VERTICAL 竖(豎)	DOT 点	SLASH LEFT 撇	ANGLE 角	TWIST 弯	HOOK 七(鉤)	REPEAT 又(複)	SLASH RIGHT 捺
BASIC STROKE		—	丨	丶	ノ	𠂉	乛	乚	冂	㇏
VARIATIONS OF STROKE		一 𠂇	丨 亅 𠃌 𠃍	丶 ㇀ ㇇ ㇈ ㇉	ノ 丿 ㇒	𠂉 𠂆	乛 𠃌 𠃍 ㇆	乚 𠃍 ㇈ ㇉	冂 冃	㇏ 乀 ㇇ ㇈

1. A method for encoding an ideographic character by transcribing the character into a unique numerical code for machine storage, retrieval and reproduction of the character by a digital data handling means, comprising:

(a) digitizing the character into a uniquely programmed numerical code compatible with said digital data handling means; and

(b) providing a location in a storage means in said digital data handling means, and identifying the location with said uniquely programmed numerical code generated by:

utilizing a group of ten basic, universal forming strokes which can be combined in the writing of any of said characters, each of the strokes having a unique, single digit numerical equivalent code;

duplicating the character by assembling the strokes necessary to form the character in the same manner and sequence as the character is written manually, following known, established rules governing the sequence in which the strokes are made in writing the character; and

providing a reference character to serve as a guide in the assembly of the strokes, said reference character being a simulated ideographic-type character resulting from assembling all the strokes in said group in sequence according to the numerical order of the single-digit numerical code of the strokes and in accordance with the rules governing the sequence in which the strokes are made in writing the character; and

(c) retrieving the digitized character from the storage means by generating the corresponding location numerical code by repeating the sequence of step (b).

4,505,603

THERMAL TRANSFER COLOR PRINTER AND A METHOD RELATING THERETO

Masasumi Yana, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Feb. 14, 1983, Ser. No. 466,046
Claims priority, application Japan, Feb. 16, 1982, 57-22144
Int. Cl.³ B41J *3/02*
U.S. Cl. 400—120 **14 Claims**

1. A thermal transfer color printer for printing a color image comprising:

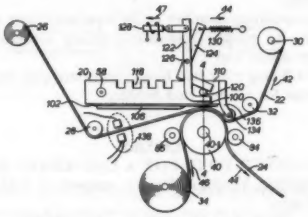
a thermal printhead having a linear array of thermal elements which are selectively energized by color component electrical signal representing the color image to be printed;

a color carrier sheet supported for movement across said printhead in a direction substantially perpendicular to said array, with one face of the sheet being positioned in heat

transfer relationship with said thermal elements, said carrier sheet having a plurality of different color-record forming materials, each material alternatively and successively distributed in areas arranged along said perpendicular direction;

a record medium sheet supported on the opposite face of said carrier sheet for movement along said perpendicular direction;

means for selectively forcing said carrier sheet and record medium sheet in contact with said printhead for thermally transferring said color materials from the carrier sheet onto the record medium when said thermal elements are energized;



a carrier sheet drive means for transporting said carrier sheet in a direction along said perpendicular direction while the carrier sheet and record medium contact said printhead;

a record medium drive means for transporting said record medium in said first direction at substantially the same rate as said carrier sheet printhead, said record medium drive means also including means for transporting said record medium in a second direction, opposite to said first direction while the carrier sheet and record medium are disengaged from said printhead; and

separating means for separating said carrier sheet from said record medium while said carrier sheet and said record medium are transported in said second direction.

4,505,604

HAMMER DEVICE OF PRINTER

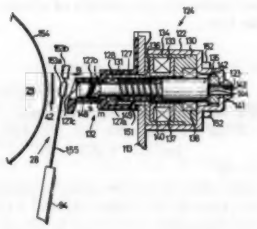
Takeshi Takemoto, Yamato, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jan. 28, 1982, Ser. No. 343,480

Claims priority, application Japan, Jan. 28, 1981, 56-9580[U]

Int. Cl.³ B41J *1/30*

U.S. Cl. 400—144.2 **7 Claims**



1. In a printer hammer device comprising a striking member supported in a support frame mounted on a carriage and positioned adjacent a platen of a printer for axial reciprocatory movement relative to a plurality of type members supported on fingers of a rotatable print wheel, said striking member being operative to strike a type member at its back and force the type member against an ink ribbon to impact against a paper positioned on the platen so as to print a character on the paper,

the improvement wherein said striking member has a striking end element joined at one end to said striking member and adapted at its other end for striking said type member, and means for preventing ink from contaminating the support frame of the hammer device including a peripherally extending groove located at the joinder of said one end of said striking end element with said striking member.

4,505,605

RIBBON CARTRIDGE

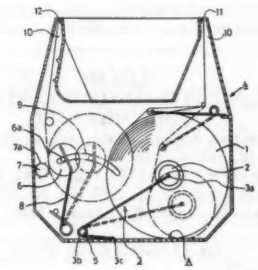
Yuzo Hasegawa, and Naokazu Shimoda, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 28, 1983, Ser. No. 546,280

Claims priority, application Japan, Nov. 20, 1982, 57-175694[U]

Int. Cl.³ B41J *35/28*

U.S. Cl. 400—208 **9 Claims**



1. A ribbon cartride comprising a case; a supply spool disposed within said case, for carrying a supply of ribbon, said ribbon having two edges and two surfaces; a take up spool disposed within said case, for winding up said ribbon as supplied by said supply spool; a spring member for biasing said supply spool so that one of said surfaces of said ribbon wound on said supply spool is pressed continually against an inside wall surface of said case;

the point of contact of said supply spool and said wall surface travelling along said wall surface as ribbon is removed from said supply spool; means to maintain substantially constant tension on said ribbon as it is unwound from said supply spool comprising a rough surface on the part of said inside wall surface which said supply spool traverses as ribbon is removed from said supply spool, the degree of roughness of said rough surface increasing at a substantially constant rate in the direction of movement of the contact point of said supply spool with said rough surface as the supply spool moves across the rough surface in response to ribbon being removed from said supply spool, the increase in ribbon tension due to said increase in frictional resistance counteracting a decrease in ribbon tension due to a decrease in biasing force supplied to the supply spool by said spring member.

4,505,606

MECHANICAL PENCIL WITH SELF-TAPPING PROPELLING NUT AND THE METHOD OF PRODUCING SAME AND PROPELLING A LEAD CONTAINED THEREIN

John C. Lockwood, Atlanta, Ga., assignor to Scripto, Inc., Atlanta, Ga.

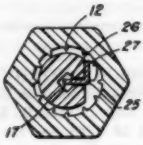
Filed Jun. 21, 1982, Ser. No. 390,681

Int. Cl.³ B43K *21/08, 24/00*

U.S. Cl. 401—55 **20 Claims**

1. In a mechanical pencil of the type including a barrel having a rear portion adapted to hold a ferrule and a forward

portion with a conical end, a tube formed with a longitudinal slot therein disposed within said barrel, means to cause relative rotation between said tube and said barrel and a writing lead propelling means mounted to travel longitudinally in said slot of said tube, the improvement comprising: an axially moveable



writing lead propelling means having an angled outwardly extending ear which upon forward longitudinal axial movement engages and cuts into the interior of said barrel thereby forming a helical path responsive to rotation of said tube with respect to said barrel, whereby writing lead may be projected forwardly and outwardly from said barrel and said tube.

4,505,607

RETRACTABLE-TYPE COSMETIC CONTAINER WITH REMOVABLE BASE

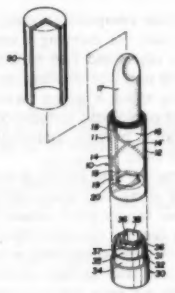
Takashi Sugiyama, Kodaira, Japan, assignor to Yoshida Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 345,529, Feb. 3, 1982, abandoned. This application Sep. 26, 1983, Ser. No. 535,531

Claims priority, application Japan, Mar. 25, 1981, 56-40683[U]

Int. Cl.³ A45D *40/06, 40/16*

U.S. Cl. 401—78 **3 Claims**



1. A cosmetic container of the retractable type, said container comprising:

a cylindrical holder including an outer sleeve having open opposite ends and a side wall having formed in an inner surface thereof a pair of diametrically opposed helicoidal grooves, an inner tube rotatably positioned within said outer sleeve and including a side wall having extending therethrough a pair of diametrically opposed vertical slots having closed lower ends, said inner tube having a lower end plate having therethrough an opening of polygonal configuration including at least five sides, and a carrier cup positioned within said inner tube for supporting a cosmetic material and for vertical movement relative to said inner tube, said cup having extending therefrom a pair of pins, each said pin extending through a respective said slot in said inner tube and engaging in a respective said helicoidal groove in said outer sleeve;

a manipulating member adapted to be detachably connected to said holder and including a hollow projection having a polygonal cross section corresponding in configuration to the shape of said opening, said projection including side walls and an outwardly extending flange formed at an upper end of said side walls, said flange being engagable by snap action with an upper surface of said end plate for preventing said manipulating member from slipping off said holder, said side walls and said flange having therein vertically extending slits, thereby providing inward flexibility to said projection side walls;

both a lower surface of said end plate surrounding said opening and an upper portion of said flange having inclined surfaces forming means for enabling said projection to be inserted into said opening without the necessity of first adjusting the positions of the corners of said projection to align with the positions of the corners of said opening;

said manipulating member being separable from said holder simply by pulling said manipulating member and said holder apart; and

a cap for fitting over said holder and onto said manipulating member for closing said holder.

4,505,608

LIGHTENED YOKE FOR A UNIVERSAL JOINT

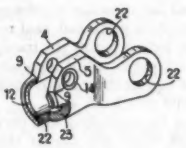
Bernard Haldric, Vendome, France, assignor to NACAM, Vendome, France

Filed Apr. 14, 1983, Ser. No. 484,936

Claims priority, application France, Apr. 15, 1982, 82 06465

Int. Cl.³ F16C *11/06*

U.S. Cl. 403—13 **9 Claims**



1. A coupling element, and in particular a lightened yoke for a universal joint, made from a blank which has been blanked from a sheet of metal and rolled so as to comprise an axially extending hub having on an end edge of the hub two inner axially adjoining chamfers which are the result of a simultaneous cold stamping operation, an axially outer chamfer of said two chamfers having a given taper and constituting a reference surface for machining and assembling operations subsequently carried out on the coupling element and an axially inner chamfer of said two chamfers having a taper less than said given taper and facilitating the penetration of a broach for machining splines in the hub.

4,505,609

SHELTER FRAME COUPLINGS

John C. Vella, 90 Bellstone Ave., Westbrook, Conn. 06498

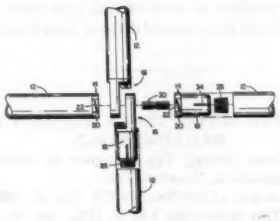
Filed Apr. 14, 1983, Ser. No. 485,300

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—91 **6 Claims**

1. The combinatin of co-operating coupling members for tubular frame pieces in the construction of a shelter, each such member being expandable for secure fit connection in an open end of such frame piece at a selected rotation position therein, at least one such member being provided with a threaded axial opening to receive a stud projecting therefrom, and at least one other such coupling member being provided with a longitudinally extending flange at one end having an opening through which the projecting portion of the stud may be received for rotation of the said other such coupling member thereon, whereby a first frame piece connected to said one such member and second frame piece connected to said other such member may be coupled with the axis of the second frame piece

extending at a selected angle to a plane in which the axis of the first frame piece resides, and each coupling member having a generally cylindrical tubular body portion which is inserted into an open end of a frame piece and which is longitudinally slotted from its inserted open end to permit diametric expansion of the said body portion, each such coupling member also having an axial bore throughout its length communicating with the body portion, and the body portion of each such member



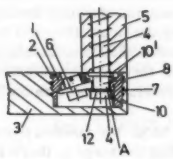
being internally threaded adjacent its open end in a frame piece to receive a tapered expansion plug, and an externally threaded tapered expansion plug adapted for engagement by a tool thrust through the bore of the coupling member to rotate the plug and thus draw it into the open end of the body portion to expand the same and thus secure the coupling member in the selected rotated position within the open end of the frame piece.

4,505,610

JOINING DEVICE

Erich Röck, Höchst, and Helmut Hollenstein, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed May 24, 1983, Ser. No. 497,562
Claims priority, application Austria, Jun. 11, 1982, 2265/82
Int. Cl.³ B25G *3/00*
U.S. Cl. 403—231 **7 Claims**



1. A device for connecting together at right angles two furniture parts, said device comprising:

a dowel casing adapted to be inserted into a bore at a side face of one furniture part, said dowel casing having circumferentially outer clamping ribs;

a screw adapted to be screwed into an edge of the other furniture part, said screw having a screw head;

said dowel casing having an eccentrically positioned aperture receiving said screw head when the two furniture parts are in the respective positions to be connected together;

holding means rotatably mounted in said dowel casing for clamping said screw within said dowel casing, and thereby connecting the furniture parts; and

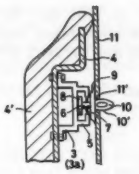
said dowel casing having, at an internal wall adjacent said aperture and opposite said holding means, rib means, extending in the direction of insertion of said dowel casing, for being pressed into by a portion of said screw head upon operation of said holding means for clamping said screw.

4,505,611

UPHOLSTERY FIXING DEVICE

Tsuneyasu Nagashima, Kanagawa, and Youji Sato, Yokohama, both of Japan, assignors to Kasai Kogyo Co., Ltd., Tokyo and Nifco Inc., Yokohama, both of, Japan

Filed Feb. 24, 1983, Ser. No. 469,496
Claims priority, application Japan, Feb. 26, 1982, 57-25795[U]
Int. Cl.³ B25G *3/00*; A44B *21/00*; B60R *13/02*; E04B *1/38*
U.S. Cl. 403—406 **11 Claims**



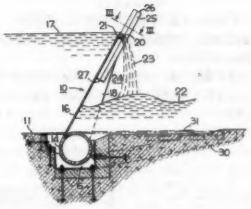
1. A device for fixing a first panel member to a second panel member comprising: a bracket to be fixed to the first panel member, said bracket including first connecting means connectable to said first panel member and an upper plate; a holdfast comprising a holdfast tip insertable into an associated aperture in a second panel member, and an axle extending rearwardly from said tip; second connecting means connecting said holdfast to said bracket; and at least one of said first and second connecting means comprising a plurality of flexible straps operatively disposed between said first panel member and said holdfast when the device is fixed to the first panel member for permitting adjustment of the holdfast relative to the first panel member and thus accommodating any misalignment with the aperture in the second panel member.

4,505,612

AIR ADMISSION APPARATUS FOR WATER CONTROL GATE

George W. Shelley, Jr., York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 15, 1983, Ser. No. 523,120
Int. Cl.³ E02B *7/46, 7/52*
U.S. Cl. 405—101 **3 Claims**



1. A water control gate comprising a gate having a tube member with a plate member extending from said tube member and sized to be received within a waterway with means pivotally securing said tube member to a floor of said waterway and said plate member extending between sidewalls of said waterway; said gate further having a plurality of radially extending reinforcing ribs laterally spaced along a downstream surface of said plate member;

means for pivotally moving said gate between a maximum closed position and a plurality of open positions with said gate pivoted toward a downstream side of said waterway when rotated toward said open positions;

a rigid conduit secured to a downstream side of said gate for movement therewith and extending generally radially from the axis of rotation of said gate; said conduit sized

sufficient to present a first opening in communication with atmospheric air and a second opening in communication with a bounded volume of air defined by said downstream radial surface of said gate and a water curtain spilling over said gate.

4,505,613

METHOD FOR LINING PIPES IN PIPELINES

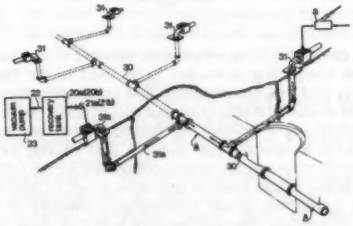
Motoyuki Koga, Tokyo, Japan, assignor to Hakko Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1983, Ser. No. 490,093

Claims priority, application Japan, Apr. 30, 1982, 57-74335; Apr. 30, 1982, 57-74336; Apr. 30, 1982, 57-74337; Apr. 30, 1982, 57-74338

Int. Cl.³ F16L *55/18*

U.S. Cl. 405—154 **13 Claims**



1. A method for lining cooperating pipes of an underground pipeline which pipeline includes a plurality of branch pipes each having an end which opens to the atmosphere, comprising the steps of:

flowing carrier air in said cooperating pipes and through at least one of said branch pipes and said pipeline;

supplying plastics mist in said cooperating pipes via said carrier air;

discharging said carrier air together with said plastics mist out of said cooperating pipes; and

recovering said plastics mist into a plastics mist recovery tank.

4,505,614

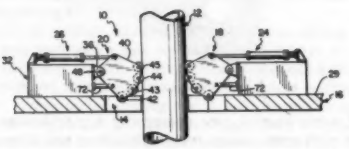
CAM ARM CENTRALIZER

Reynold G. Anschutz, Middletown, Ohio, assignor to Armco Inc., Middletown, Ohio

Filed Oct. 15, 1982, Ser. No. 434,474

Int. Cl.³ E02B *17/00*; F16C *29/00*

U.S. Cl. 405—195 **13 Claims**



1. A centralizer assembly for centering a pipe in an opening in a support, the combination comprising:

a plurality of support blocks equally spaced around the opening and rigidly coupled to the top, substantially planar surface of the support;

a plurality of cam units, each pivotally coupled to one of said support blocks for pivotal movement about a pivot axis parallel to the plane containing the top surface of the support,

each of said cam units including a camming surface facing radially inwardly towards the longitudinal axis of the opening for engaging the pipe, said camming surface increasing in radius from said pivot axis from a first end towards a second end; and

power means, coupled to each of said support blocks and cam units, for pivoting each of said cam units from a retracted position spaced away from the pipe located in the opening to an active position wherein said larger radii second end of said camming surface engages the pipe,

said camming surfaces included in each of said cam units each comprising the surfaces of a plurality of rollers rotationally coupled to each of said cam units about axes parallel to the pivot axes of the cam units associated therewith.

4,505,615

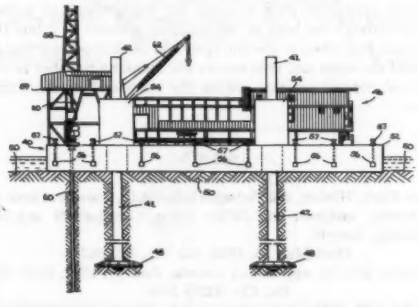
METHOD OF SUPPORTING A SHALLOW WATER DRILLING BARGE

Darrell L. Evans, Spring, Tex., assignor to Atlantic Pacific Marine Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 349,459, Feb. 12, 1982, Pat. No. 4,456,404. This application Aug. 6, 1982, Ser. No. 405,861

Int. Cl.³ E02B *17/04*

U.S. Cl. 405—196 **8 Claims**



1. A method of supporting a drilling barge for conducting drilling operations at a location characterized by a shallow water depth and a silty water bed of low load bearing capacity, said method comprising the steps of

(a) floating a submersible platform, having jacking legs and jacking mechanisms thereon, to said location;

(b) ballasting said submersible platform until it rests on said water bed;

(c) floating a drilling barge into position over the submerged platform and flooding the barge so that it comes to rest on the platform, the total weight of the platform and barge being so related to their buoyancy and to the bottom surface area of the platform that the pressure exerted by the platform on the water bed is less than the supporting capability of the water bed, and

(d) jacking the legs of the platform down into the water bed to a depth where the soil provides increased bearing capacity.

4,505,616

SELF-LOCKING CHOCK SYSTEM FOR A JACK-UP RIG UNIT

Andrew Grzelka; David R. Hodges, both of Gautier, and Lawrence M. Ruckdeschel, Pascagoula, all of Miss., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 26, 1983, Ser. No. 498,317

Int. Cl.³ E02B *17/08*

U.S. Cl. 405—198 **5 Claims**

1. A rack chock system comprising:

(a) a longitudinally extending support member,

(b) a plurality of similar cam means grouped in an unevenly

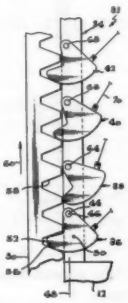
spaced apart sequential alignment along said support member,

(c) a longitudinally extending rack member separate from and adjacent to said support member,

(d) a rack profile on said rack member adapted to contact and selectively engage with said cam means.

(e) each of said cam means having a pivot axis positioned a fixed distance from an adjacent one of said cam means.

(f) each of said cam means movable about said pivot axis to



contact and ride along said rack profile where relative motion between said support member and said rack member is in a first direction, and adapted to selectively enter into a locking engagement when relative motion is in a second direction generally opposite to the first direction so that further relative motion therebetween is restricted, and

(g) unlocking means to move said cam means out of said locking engagement so that relative motion is permitted between said support member and said rack member.

4,505,617

STABILIZING BLUFF STRUCTURES AGAINST OSCILLATION

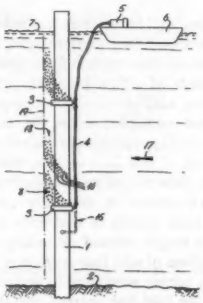
Donald S. Miller, Newton Blossomville, and Roger King, Milton Keynes, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 193,110, Oct. 2, 1980, abandoned. This application Jan. 4, 1983, Ser. No. 455,553

Claims priority, application United Kingdom, Oct. 12, 1979, 7935478

Int. Cl.³ E02B *17/00*

U.S. Cl. 405—211 **1 Claim**



1. A method of stablising a bluff, upright rigid structure of substantial length fixed at at least one of the ends of said length to a stationary supporting surface, the structure being exposed in use to substantial relative motion of a first fluid medium in a direction transverse to the length of the structure, said relative motion being such as to give rise to a low pressure region down stream of the structure and causing substantial transverse oscillation of the structure, the method comprising the steps of selecting an outlet means for a second fluid medium in the form of an annular member, placing the annular member around but spaced from said structure so as to encompass said structure at a selected height above the supporting surface, releasing from said annular member the second fluid medium with said annular member being itself free of any encompassment, so that said second medium when so released is free to move transversely away from said rigid structure and will be attracted to said low pressure region, so breaking the synchronism of vortex-shedding along the length of said structure that causes said transverse oscillation.

4,505,618

MARINE RISER PROTECTOR FOR USE ON OFFSHORE OIL DRILLING RIGS IN ICY WATERS

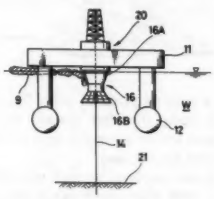
Nobuyoshi Yashima, Funabashi, Japan, assignor to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1983, Ser. No. 490,147

Claims priority, application Japan, Oct. 22, 1982, 57-158987[U]; Mar. 10, 1983, 58-33423[U]

Int. Cl.³ E02B *15/02*

U.S. Cl. 405—211 **2 Claims**



1. In a semi-submersible offshore structure comprising normally submerged pontoon means, standing posts disposed on the pontoon means, a platform mounted on the standing posts and supported above sea level by the standing posts and a marine riser extending from the platform toward the sea bottom, a riser protector secured to the underside of the platform and extending downward therefrom, the riser protector comprising a truncated conical upper portion having a diameter which is gradually reduced in the downward direction and a truncated conical lower portion having a diameter which is gradually increased in the downward direction, the lower portion being connected to the bottom of the upper portion and having a grid-like wall structure, wherein the level of the structure with respect to sea level is controlled such that in an ice-forming or ice-floating season or area, the sea level corresponds to the upper portion of the riser protector and in an iceless or ice-free season or area, the sea level corresponds to the lower portion.

4,505,619

COMBINED BOAT TRAILER AND PORTABLE DOCK APPARATUS

Harold L. Sargent, P.O. Box 300, Cortaro, Ariz. 85230

Filed Feb. 22, 1982, Ser. No. 351,319

Int. Cl.³ B60D *3/10*; B63C *1/00, 13/00*

U.S. Cl. 405—220 **3 Claims**

1. A boat trailer and portable dock apparatus for towing a boat to a body of water and for providing a dock after the boat is launched, said apparatus comprising in combination:

a. a wheeled boat trailer for carrying a boat and having a front end from which said apparatus may be towed by a motorized vehicle and having a rear end from which the boat may be launched into a body of water;

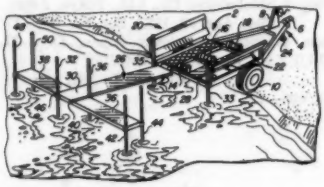
b. a main dock ramp having a first end hingedly connected

to the rear end of said wheeled boat trailer and a second end opposite the first end thereof, said hinged connection permitting said main dock ramp to be extended outwardly from the rear end of said wheeled boat trailer in an extended position over the body of water;

c. first support means coupled to said main dock ramp proximate the second end thereof for supporting the second end of said main dock ramp above the surface of the body of water in a substantially horizontal position;

d. elevating means secured to said wheeled boat trailer and coupled to said main dock ramp for pivoting the second end of said main dock ramp upwardly about said hinged connection to allow said apparatus to be backed into or pulled from the body of water by moving said wheeled boat trailer while said main dock ramp extends rearwardly from said wheeled boat trailer;

e. said hinged connection between said main dock ramp and said wheeled boat trailer allowing said main dock ramp to lie substantially horizontally across said wheeled boat



trailer in a stowed position with the second end of said main dock ramp directed toward the front end of said wheeled boat trailer when the boat is being carried by said wheeled boat trailer; and

f. pivoting means secured to said wheeled boat trailer and coupled to said main dock ramp for pivoting said main dock about said hinged connection from said stowed position toward said extended position, said pivoting means comprising:

i. a lever arm having a first end secured to said main dock ramp proximate said hinged connection, said lever arm extending generally downward when said main dock ramp is in its stored position, said lever arm having a second end opposite the first end thereof;

ii. a winch secured to said wheeled boat trailer;

iii. a first cable extending between said winch and the second end of said lever arm for pulling forwardly and upwardly on the second end of said lever arm as said winch is tightened to pivot said main dock ramp away from its stowed position.

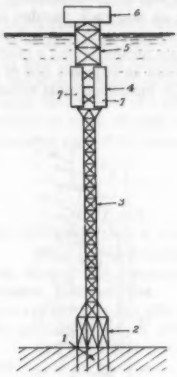
4,505,620

FLEXIBLE OFFSHORE PLATFORM

Bernard Andrier, Louveciennes, France, assignor to Entrepose G.T.M. pour les Travaux Petroliers Maritimes et PM, Levallois-Per-per; Entrepose d'Equipements Mecaniques et Hydrauliques E.M.H., Saint Cloud and Societe Francaise d'Etudes d'Installations Siderurgiques SOFRESID, Montreuil, all of, France

Filed Oct. 25, 1983, Ser. No. 545,153
Claims priority, application France, Sep. 22, 1983, 83 15045
Int. Cl.³ E02D *21/00*
U.S. Cl. 405—224 **6 Claims**

1. A flexible offshore platform comprising a foundation which fixes the platform on the sea-bed, a flexible column fixed to said foundation extending over more than half of the total height of the platform, a stabilizer fixed to the top of the flexible column, a deck and a second column connecting the stabilizer to the deck, the stabilizer being positioned to be immersed in the water and entraining a given mass of water, the mass formed by the mass of the stabilizer and the mass of water entrained by the stabilizer providing a stabilizing effect for the platform, and wherein the platform structure itself has a rigid-



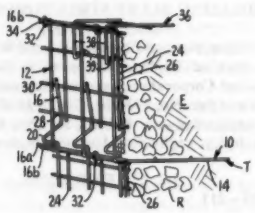
ity able to generate reaction stresses which resist actions due to waves, wind and current.

4,505,621

WIRE RETAINING WALL APPARATUS AND METHOD FOR EARTHEN FORMATIONS

Harold K. Hilfiker, and Arthur L. Hilfiker, both of Eureka, Calif., assignors to Hilfiker Pipe Co., Eureka, Calif.

Filed May 25, 1983, Ser. No. 497,867
Int. Cl.³ E02D *5/00*
U.S. Cl. 405—284 **9 Claims**

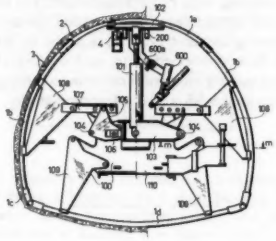


1. In a retaining wall for earthen formations comprising wire trays having floor and face sections with a fold line therebetween, an improved construction for connecting the distal end of the face section of a first such tray to the fold line of a second such tray, said construction comprising: a transverse wire fixed to and extending across the distal end of the face section of the first tray; a plurality of wires fixed to and extending longitudinally of said face section, said plurality of wires having elongate ends extending longitudinally from the distal end of said face section in generally coplanar relationship thereto and at least certain of said ends having a protrusion intermediate the length thereof extending laterally therefrom and out of the plane of said face section at a location adjacent said distal end; a corner wire fixed to and extending across said second tray at the fold line thereof, the floor section of said second tray being supportable on the transverse wire of the first tray with the protrusions of the first tray engaged over the corner wire of the second tray; and, means to retain the corner wire of the second tray in engagement beneath the protrusions of the first tray.

4,505,622
PROCESS AND ARRANGEMENT FOR THE SUPPORT OF UNDERGROUND CAVITY SYSTEMS BY AN EFFICIENT SAFETY CASING WALL

Csaba Asszonyi, Budapest; István Klausz, Sárisáp; István Kmety, Dprog; Nándor Meitzen, and Rezso Pásztor, both of Budapest, all of Hungary, assignors to Magyar Szénbányászati Trószt, Tatabanya, Hungary

Continuation of Ser. No. 906,778, May 17, 1978,. This application Jun. 2, 1980, Ser. No. 155,789
Claims priority, application Hungary, May 17, 1977, MA 2875
Int. Cl.³ E21D *11/00*
U.S. Cl. 405—288 13 Claims

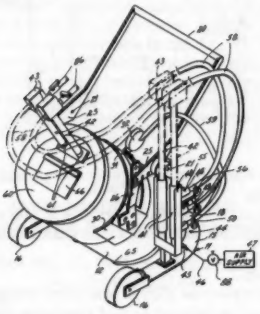


1. The method of bracing an underground cavity comprising the steps of:
(a) contacting the cavity with a circumferentially continuous and tensionable layer;
(b) inserting an expansible, closed-ring arch into said cavity against said layer;
(c) tensioning said arch to maintain stress both in the plane of the expanding ring and in its intermediate field; and
(d) clamping said tensioned arch in position.

4,505,623
APPARATUS FOR TRANSFERRING POWDER FROM BULK DRUMS

Douglas C. Mulder, Wellington, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Sep. 17, 1982, Ser. No. 419,166
Int. Cl.³ B65G *53/26*
U.S. Cl. 406—114 3 Claims

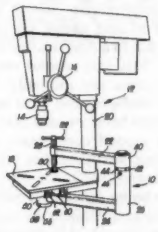


1. Apparatus for emptying a large drum of powdered material comprising,
a support for holding said drum with its axis at approximately 45°,
said support including an arcuate band surrounding more than one-half the circumference of said drum and in intimate contact therewith,
a vibrator mounted adjacent said drum to vibrate said powdered material,
a cap for said drum,
said cap having at least one hole therein and a sleeve surrounding said hole, said sleeve being aligned with the lower corner of said drum,
a feed tube and a guide tube surrounding said feed tube with a small clearance between said tubes, said tubes being slidable by gravity in said sleeve to the lower corner of said drum,
a vacuum pump on said feed tube, and
means supplying air under pressure to said vacuum pump to aspirate powder out of said drum when said feed and guide tubes are mounted in said sleeve, whereby atmospheric air is drawn into said drum through said clearance between said tubes to agitate and fluidize said powder adjacent the lower end of said feed tube.

4,505,624
CLAMPING TOOL

Kenneth W. Kelly, Jr., 1824 Burnett Rd., Topeka, Kans. 66604

Filed Oct. 11, 1983, Ser. No. 540,275
Int. Cl.³ B23Q *1/00*
U.S. Cl. 408—109 7 Claims

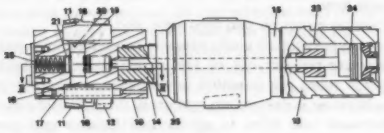


1. In combination with a workpiece-supporting table of a drill press for drilling holes in the workpiece, a tool for clamping the workpiece to the table, said tool comprising:
an elongated, lower arm having one end thereof beneath the table and extending outwardly beyond the latter;
an elongated post having a vertical longitudinal axis and rigidly secured at the lower end of the post to the arm at the opposite end of the latter,
said post extending upwardly from the arm and having an upper end disposed above a horizontal plane through the table;
journal means under the table at said one end of the arm securing the arm to the table for swinging movement within a horizontal plane below the table through an arc but slightly less than 360 degrees;
an elongated, upper arm having a clamping device mounted thereon at one end of the upper arm; and
pivot means at said upper end of the post attaching the upper arm at the opposite end of the latter to the post for swinging movement within a horizontal plane spaced above the table through a 360 degree arc,
said planes and the longitudinal axes of the arms being in spaced parallelism,
said axis being parallel with the axes of swinging movement of the arms,
said device being movable to and from a position overlying the table upon swinging movement imparted to the upper arm.

4,505,625
BORING DEVICE

Nils G. Lundvall, Ubby, Sweden, assignor to Santrade Ltd., Lucerne, Sweden

Filed Feb. 5, 1982, Ser. No. 346,170
Claims priority, application Sweden, Feb. 19, 1981, 8101109
Int. Cl.³ B23B 29/034
U.S. Cl. 408—155 11 Claims



1. A boring head for the internal machining of bores in workpieces, comprising:

a boring head body rotatable about a longitudinal axis and including a radial bore having a radial axis extending perpendicularly to said longitudinal axis,

a cutting edge holder movably mounted on said boring head so that a cutting edge carried thereby is movable toward and away from said longitudinal axis,

first and second surfaces facing one another in the direction of said radial axis and being yieldably urged toward one another, at least one of said surfaces being rotatable relative to the other about said radial axis,

said first and second surfaces including first and second cam means, respectively, which extend circumferentially relative to said radial axis in a non-continuous manner such that in a first relative rotational orientation between said first and second surfaces said first and second cam means are mutually engaged to radially separate said surfaces, and in a second relative rotational orientation between said first and second surfaces said first and second cam means are mutually disengaged to permit said first and second surfaces to be radially converged,

said first surface being operably connected to said holder such that when said surfaces are radially separated said first surface is moved radially outwardly and moves said cutting edge radially outwardly from an inactive position to a maximum outward working position,

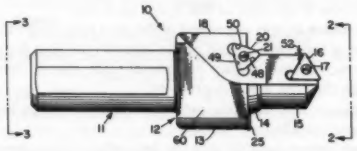
spring means for yieldably urging said first and second surfaces toward one another, and

control means for rotating said at least one said surface about said radial axis such that in response to no more than one revolution, said cutting edge is moved from said inactive position to said maximum outward working position.

4,505,626
CUTTING TOOL

Craig Benhase, Milford, Ohio, assignor to Dexport Tool Company, Inc., Cincinnati, Ohio

Filed Feb. 24, 1983, Ser. No. 454,723
Int. Cl.³ B23B 51/00
U.S. Cl. 408—224 1 Claim

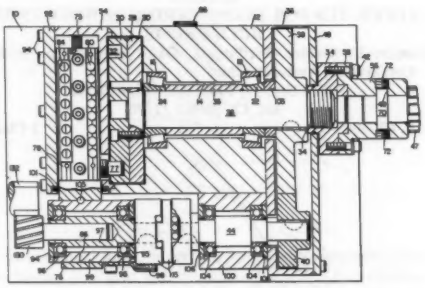


1. A cutting tool comprising: a rod having an upper cylindrical body and a lower cylindrical body, said lower cylindrical body having flat surfaces on opposite sides, a pair of flutes formed in said lower cylindrical body, a triangular cutting element including a mounting hole located in said lower cylindrical body, means passing through said hole for detachably securing said triangular cutting element to said lower cylindrical body, said cutting element having at least a portion thereof projecting outwardly of said body and said cutting element abutting the surface of a flute formed within said body, a second cutting element triangular in shape and abutting walls formed in said flute portion of said body and having three cutting edges projecting beyond the first mentioned triangular cutting element lying in the flute containing said first triangular cutting element, and a third triangular cutting element having a cutting edge, said element secured against walls in said body and having a cutting edge projecting beyond the cutting edges of said first and second mentioned cutting elements, said last mentioned cutting element lying in a plane in the flute 180° opposite said first mentioned flute, said cutting element tool having a facing cutting element indexable to three positions for facing and provided with a 110° clearance angle.

4,505,627
POLYGON BOX TOOL MILLING CUTTER APPLIED TO AUTOMATIC SCREW MACHINES

Harold E. Wheeler, Athens, Pa., assignor to The Wheeler Tool Company, Athens, Pa.

Filed Dec. 22, 1982, Ser. No. 452,365
Int. Cl.³ B23C 3/24
U.S. Cl. 409—190 10 Claims



1. A polygon box tool-milling cutter comprising:

a main housing,

a cam having at least one face, a groove in said cam at least one face, said cam including a cam shaft rotatable in said housing,

a front housing,

a lightweight transverse slide in said front housing,

a cam follower pin secured to said transverse slide and extending from said transverse housing into said groove in said cam face for reciprocating movement of said transverse slide during rotation of said cam by said cam shaft,

an auxiliary cutter spindle housing secured to one end of said transverse slide for securing a milling cutter on one end of said transverse slide for reciprocating movement with said transverse slide, and means for rotating said milling cutter relative to a workpiece.

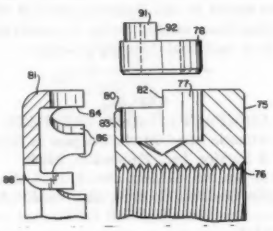
4,505,628
BEARING LOCKNUT

George C. Meibuhr, 8325 Midland Rd., Mentor, Ohio 44060

Continuation-in-part of Ser. No. 241,522, Mar. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 054,156, Jul. 2, 1979, abandoned, which is a division of Ser. No. 915,867, Jun. 15, 1978, abandoned. This application Sep. 21, 1982, Ser. No. 420,833

Int. Cl.³ F16B *39/02, 39/00*

U.S. Cl. 411—123 8 Claims



8. A locknut assembly for a locknut with a threaded internal bore for restraining a bearing on a shaft having a threaded external diameter, and a longitudinal axis, a slot, the locknut assembly comprising a locking cup piece, said locking cup piece having a face, a key and an edge, said face of said locking cup piece being generally planar for facing the bearing, said key for engaging the slot in the shaft fo preventing the rotation of said locking cup piece, the edge of said locking cup piece having a number of equally spaced non-360° cutouts therein, said edge of said locking cup piece overlapping part of the locknut, the locknut having a number of equally spaced holes therein, the spacing of the number of equally spaced holes in the locknut being different than the spacing of the number of equally spaced non-360° cutouts in said locking cup piece, a number of round locking keys, one of said number of equally spaced non-360° cutouts or said number of equally spaced holes being odd in number and the other of said number of equally spaced non-360° cutouts or said number of equally spaced holes being even in number, the number of said round locking keys being equal to the number of equally spaced holes in the locknut, said round locking keys being respectively non-removably fitted into said holes for rotation therein with the axis of rotation of said round locking keys being substantially perpendicular to and substantially intersecting the longitudinal axis of the shaft, and at least one of said round locking keys being selectably engageable with one of said cutouts in the edge of said locking cup piece by rotation of said one locking key in its respective hole in the locknut, the engagement of said one of said locking keys with said one of said cutouts in said edge of said locking cup piece preventing the rotation of the locknut and the non-engagement of said one of said locking keys with said one of said cutouts in said edge of said locking cup piece allowing rotation of the locknut.

4,505,629
BOOK BINDING MACHINE

Michael A. Lynch, Keene, N.H., assignor to permaTek, Inc., Las Vegas, Nev.

Filed May 17, 1982, Ser. No. 379,037

Int. Cl.³ B42C *11/00*

U.S. Cl. 412—5 32 Claims

1. A high speed casing-in and building machine for joining book covers to inserts to make a book, said covers initially being without fold line, comprising:

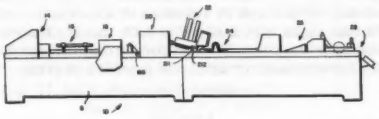
in line means for depositing book covers without hinges and fold lines one at a time in a horizontal position with their insides facing upwardly for movement along a predetermined path,

means for heating the upwardly facing side of said cover,

means for embossing the cover with longitudinally-disposed, spaced, parallel depressions constituting fold lines formed at a spacing corresponding to the thickness of the insert,

means for applying adhesive to the entire upwardly-facing surface of each cover,

means for depositing an insert, one broad side down, upon the upwardly facing surface of the cover at one side of a longitudinal center line,



means for positioning the insert on the cover at the one side of the center line at a distance therefrom corresponding to one-half the thickness of the insert, and

means for wrapping the portion of the cover extending laterally from the insert about the back of the insert and into engagement with the upwardly-facing broad side of the insert.

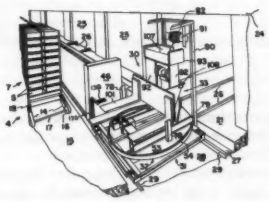
4,505,630
ARTICLE TRANSFER APPARATUS

William C. Kaschner, and Elroy Bobolts, Jr., both of Alpena, Mich., assignors to Besser Company, Alpena, Mich.

Continuation of Ser. No. 104,237, Dec. 17, 1979, abandoned, which is a continuation of Ser. No. 871,597, Jan. 23, 1978, abandoned. This application Dec. 5, 1983, Ser. No. 558,379

Int. Cl.³ F27B *9/02*

U.S. Cl. 414—152 3 Claims



1. In combination with a concrete block curing kiln having a plurality of spaced apart, longitudinally extending compartments extending laterally of a path traversing all of said compartments at corresponding ends thereof, each of said compartments havinng therein a pair of uniformly spaced apart, longitudinally extending tracks, apparatus for transferring a rack of concrete blocks from one position to another, said apparatus comprising a carriage movable along said path between said positions; a turntable; means mounting said turntable on said carriage for rotation relative thereto about a vertical axis; a pair of spaced apart main rails carried by said turntable; a transfer vehicle including lift means for supporting a rack of blocks and carrying said rack into any selected one of said kiln compartments; drive means for moving said lift means vertically; main wheel means mounting said transfer vehicle on the main rails of said turntable for movements with and relative to said turntable; driving means powered from said carriage for driving said transfer vehicle off said carriage into any selected one of said compartments and return; auxiliary wheel means independent of said main wheel means carried by said transfer vehicle; auxiliary support rails independent of said main rails mounted on said turntable for movement from a retracted

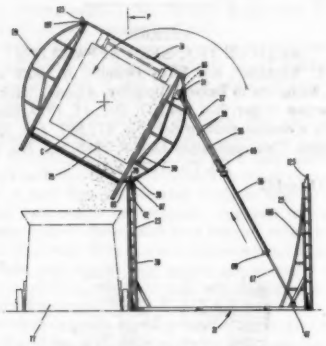
position within the confines of said carriage to an extended position beyond the confines of said carriage and adjacent the tracks of any selected compartment, the spacing between the tracks in each of said kiln compartments corresponding to the spacing between the rails of a selected one of said main rail means or said auxiliary rail means, said auxiliary wheel means and said auxiliary rail means supporting said transfer vehicle as the latter is driven off and onto said turntable; drive means coupled to said turntable for angularly moving said turntable about said vertical axis to a position in which said one of said rail means aligns with said tracks such that the tracks form a continuation thereof; and means for moving said auxiliary rail means between said retracted and extended positions.

4,505,631

METHOD AND APPARATUS FOR DUMPING CONTAINERS

Lee A. Warner, Raleigh, N.C., and Fred A. Fewin, Jr., Lubbock, Tex., assignors to Cotton Incorporated, New York, N.Y.

Filed Jan. 7, 1982, Ser. No. 337,814
Int. Cl.³ B65G 67/46
U.S. Cl. 414—359 **6 Claims**



1. A container dumping apparatus comprising:

a mobile frame having a generally upright side wall over which the container is to be dumped;

a carrier positioned on the frame for movement relative thereto, said carrier including means for securely supporting a container to be dumped;

actuating means for moving said carrier between rest and final dumping positions, said actuating means comprising:

power-driven tilting means for initial tilting of the carrier including a first portion and a second extensible/retractable portion operably connected thereto,

cable means anchored at one end to said carrier and at another end to said first portion,

said extensible/retractable second portion being arranged to act upon said cable means intermediate the anchored ends to selectively shorten the span of said cable means extending between said carrier and said extensible/retractable second portion for causing the carrier to roll upwardly along said wall from the rest position to an intermediate position wherein the container is partially tilted,

said carrier and said wall engaging with one another to define a substantially horizontal pivot axis in response to said carrier moving toward said intermediate position, said pivot axis being contained in an imaginary vertical plane,

said container and said carrier together defining a center of gravity which lies on a side of said imaginary plane opposite the side on which the container is to be dumped when said container is in said intermediate position,

power-operated second tilting means connected to said first portion for displacing said first portion and said other end of said cable means for rotating said carrier about said pivot axis to the final dumping position, said center of gravity passing across said imaginary plane during movement from the intermediate position to the final dumping position, and

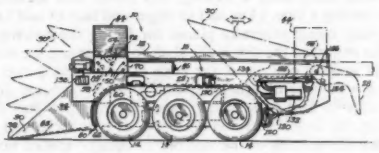
carrier returning means for positively swinging said carrier from said final dumping position and comprising first abutment means on said carrier, and second abutment means on an upper end of said second portion of said tilting means and arranged to slidably engage said first abutment means in said dumping position of said carrier for exerting forces on said carrier to positively return said carrier from said final dumping position.

4,505,632

COMPACT LOADER-TRAMMER

Phil Quenzi, Atlantic Mine, Mich., assignor to Northern Industrial Sales & Service, Inc., Painesdale, Mich.

Continuation of Ser. No. 433,502, Oct. 8, 1982, abandoned. This application Jul. 13, 1984, Ser. No. 630,344
Int. Cl.³ B60P 1/00
U.S. Cl. 414—510 **20 Claims**



19. Material handling apparatus comprising: a mobile frame defining a longitudinal axis, a raised load compartment on said mobile frame substantially in alignment with said longitudinal axis and having an open front end, a material handling bucket, a carriage mounted on said frame for longitudinal movement along the longitudinal axis of the frame, pivot means pivotally mounting said bucket to said carriage, actuating means for driving said carriage and said pivot means bidirectionally in a substantially straight line along said longitudinal axis, and cooperating means on said bucket and said frame for simultaneously pivoting and lifting the bucket to said load compartment in response to initial straight line longitudinal movement of said carriage and pivot means away from the front end of the load compartment for loading material through the open front end of said load compartment and for locking said open front end for tramming the loaded material.

4,505,633

OVERRUNING SPROCKET FOR BALE WAGON PICKUP

L. Dennis Butler, Kingsburg, Calif., assignor to Sperry Corporation, New Holland, Pa.

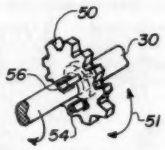
Filed Aug. 30, 1982, Ser. No. 413,111
Int. Cl.³ A01D 90/02
U.S. Cl. 414—528 **2 Claims**

1. In a bale wagon having a frame; a bale receiving table mounted on said frame; a bale pickup means supported by said frame adjacent said bale receiving table for picking up bales from the ground and transferring said bales onto said bale receiving table, said pickup means including a rotatably driven elevator operable to engage said bales and elevate them onto said bale receiving table; and drive means for operatively powering said bale pickup means, said drive means including a

drive shaft for rotatably driving said elevator, the improvement comprising:

a drive sprocket drivingly engaged with said elevator for transferring rotational power from said drive shaft to said elevator, said drive sprocket being rotatably mounted on said drive shaft for rotation thereon independently of said drive shaft;

a first drive lug rigidly affixed to said drive sroket; and



a second drive lug rigidly affixed to said drive shaft adjacent said drive sprocket to be engageable with said first drive lug such that upon rotation of said drive shaft said second drive lug engages said first drive lug to cause rotation of said drive sprocket to transfer rotational power from said drive shaft to said elevator, said first and second drive lugs being disengageable to permit said drive sprocket to rotate relative to said drive shaft during operation thereof by only one revolution less the circumferential thickness of said first and second drive lugs.

4,505,634

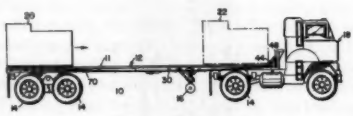
REVOLVING FLOOR APPARATUS FOR TRAILERS

Howard D. Rezac, 403 Spencer St., Gregory, S. Dak. 57533

Filed Mar. 9, 1983, Ser. No. 473,853

Int. Cl.³ B60P *1/36*

U.S. Cl. 414—528 **20 Claims**



1. A revolving floor apparatus for a trailer flat bed, comprising:

(a) conveyor means suitably mounted along at least a portion of the top and bottom surfaces of the trailer flat bed for moving a plurality of spaced apart, elongated members longitudinally of the trailer flat bed, said elongated members extending generally transversely of the trailer flat bed, said conveyor means defining a first portion having said elongated members suitably attached thereto and a second portion generally being void of said elongated members; and

(b) means for moving said conveyor means between a first position and a second position, said elongated members being attached to said conveyor means and positioned along at least a portion of the top surface of the trailer flat bed when said conveyor means is in said first pcsition, said elongated members being attached to said conveyor means and positioned below the bottom surface of the trailer flat bed in said second position, the top surface of the trailer flat bed being generally void of said elongated members when said conveyor means is in said second position.

4,505,635

LOAD LIFTING UNIT FOR A LIFT TRUCK

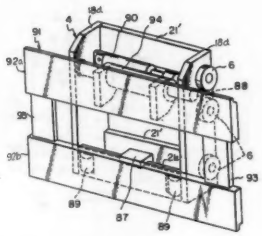
Akibumi Shinoda, Handa; Yukio Yoshioka, Ohbu, and Akio Kato, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Continuation of Ser. No. 189,838, Apr. 14, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 424,100

Claims priority, application Japan, Aug. 17, 1978, 53-100137; Mar. 20, 1979, 54-32925; Mar. 21, 1979, 54-32978; Mar. 22, 1979, 54-33989; Mar. 22, 1979, 54-33990; Mar. 23, 1979, 54-34541; Mar. 23, 1979, 54-34542; Mar. 27, 1979, 54-36673; Mar. 27, 1979, 54-36674; Apr. 11, 1979, 54-44780; PCT Int'l Appl., Aug. 17, 1979, PCT/JP79/00218

Int. Cl.³ B66F *9/14, 9/20*

U.S. Cl. 414—667 **5 Claims**



1. A lift truck comprising:

a truck body having a pair of front wheels and a driver's seat disposed behind and above said front wheels;

a pair of left and right uprights comprising (i) a pair of left and right outer masts provided at front portions of said truck body of said lift truck, and (ii) a pair of left and right inner masts arranged to be moved up and down between and along said outer masts;

a lift member having left and right side plate members, having upper and lower cross plate members extending in a lateral direction between the left and right side plate members, said lower cross plate member mounting rollers, and a horizontal shaft supported at its ends by said left and right side plate members, all disposed between said inner masts;

two lift cylinders separately disposed adjacent to and rearward of said left and right uprights, respectively, for lifting and lowering said inner masts and said lift member relative to said outer masts, each of said two lift cylinders being disposed over and adjacent the axis of rotation of a corresponding one of said front wheels within a respective area in which the view from the driver's seat of said lift truck is obstructed by said uprights;

lift chain or cable means coupled to each of said uprights for supporting said lift member in the space extending between said pair of left and right uprights so that said lift member is capable of being moved up and down, said space extending rearwardly toward the driver's seat from the front side of the space between said left and right uprights, said space being free of any power cylinders or motors for moving said lift member up and down;

a load handling attachment carried by said lift member, said attachment comprising a side shift fork provided on a fork bracket, said fork bracket contacting said rollers and being mounted on a holder which is slidable on said horizontal shaft in a lateral direction which perpendicularly crosses the longitudinal axis of said truck body relative to said lift member; and

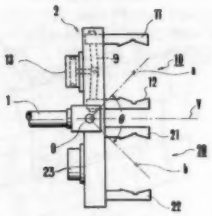
an actuating means arranged within said space for actuating said attachment carried by said lift member, said actuating means comprising a shift cylinder, pivotally connected at a cylinder end to one of the side plate members of said lift member and at a piston rod end to said fork bracket

holder, arranged at the rear of said fork bracket within said space.

4,505,636
ROBOT MACHINES

Yoshihide Sugino, Chigasaki; Takashi Tsumura, Atsugi; Junnosuke Nakamura, Yokohama, and Kazuyoshi Yamaki, Chigasaki, all of Japan, assignors to Yamatake Honeywell Co., Ltd., Japan

Continuation of Ser. No. 292,303, Aug. 12, 1981, abandoned. This application Nov. 1, 1983, Ser. No. 547,462
Claims priority, application Japan, Aug. 15, 1980, 55-11754
Int. Cl.³ B25J *13/00*
U.S. Cl. 414—736 **11 Claims**



1. A robot machine for grasping and releasing an article, said robot machine comprising:

an arm;

a hand rotatably mounted to said arm such as to rotate about a predetermined axis around a center of rotation;

two sets of grasping units equally spaced from said predetermined axis, each set of said two sets of said grasping units comprising a pair of opposed fingers, said pair of opposed fingers having a predetermined grasping center;

means for causing said pair of opposed fingers to move towards and away from said predetermined grasping center, said means for causing said pair of opposed fingers to move towards and away from said predetermined grasping center moving in a plane generally perpendicular to said predetermined axis;

each finger of said pair of opposed fingers comprising an elongated member extending from said hand, each finger further being substantially parallel to the other of said pair of opposed fingers; and

means for rotating said hand about said predetermined axis.

4,505,637
AXIAL-FLOW CENTRIFUGAL PUMP FOR THE CIRCULATION OF FLUID

Wladyslaw Raczynski, Magency, France, assignor to Framatome & Cie, Courbevoie, France

Continuation of Ser. No. 138,520, Apr. 9, 1980, abandoned. This application Aug. 13, 1982, Ser. No. 407,990
Claims priority, application France, Apr. 12, 1979, 79 09333
Int. Cl.³ F04D *29/08*
U.S. Cl. 415—112 **4 Claims**

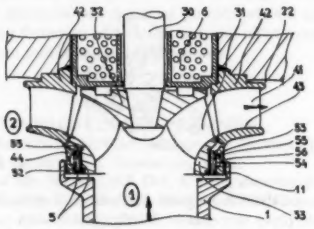
1. A centrifugal pump for the circulation of fluid, comprising

(a) a flow chamber of toroidal shape surrounding an inlet neck and bounded at the side opposite from the latter by a cross wall;

(b) a rotor mounted at the end of a drive shaft which extends, in prolongation of the axis of said inlet neck, from the outside of said cross wall, said rotor comprising a plurality of blades fixed between a disc mounted at the end of said drive shaft and an outer shroud of toroidal shape; and

(c) a stator in the form of an outlet volute consisting of a plurality of fixed blades arranged between said cross wall and an outer shroud located in the prolongation of said outer rotor shroud and connected to the end of said inlet neck by a substantially cylindrical connector part surrounding the upstream portion of said outer rotor shroud, at the interior of which is arranged a hydrostatic bearing comprising a journal arranged on the upstream portion of said outer rotor shroud; and

(d) a bearing arranged on said connector part and comprising a plurality of bearing pockets, each being placed in communication with the interior of said flow chamber by



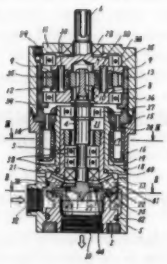
a feed orifice for fluid at the pressure prevailing in said flow chamber;

(e) an annular gap being arranged downstream of the bearing between said outer shrouds of said rotor and said stator, said downstream gap being placed in communication with said inlet neck upstream of said bearing by at least one pressure-balance duct arranged in said connector part.

4,505,638
UNDERWATER HYDRAULIC MOTOR

Kenji Sugino, and Yukiaki Nagata, both of Uozu, Japan, assignors to Sugino Machine Limited, Uozu, Japan

Filed Jan. 8, 1982, Ser. No. 339,061
Claims priority, application Japan, Aug. 11, 1981, 56-126287
Int. Cl.³ F01D *11/00;* **F16J** *15/50*
U.S. Cl. 415—113 **1 Claim**



1. In an underwater hydraulic motor including a casing, a turbine rotor within said casing and rotatable in response to a jet of pressurized water applied thereto, an output shaft for transmitting rotary power of said turbine rotor to an external mechanical load, and reduction gear means disposed between said turbine rotor and said output shaft, the improvement comprising:

an oil immersion chamber containing therein bearings of said turbine rotor, said reduction gear means and bearings of said output shaft, said oil immersion chamber being filled with oil and sealed hermetically;

resilient means forming a part of partition means between the interior of said oil immersion chamber and the exterior of said motor, said resilient means being in the form of an annular hollow member arranged in concentric relation with said turbine rotor, wherein said annular hollow member is accommodated in an annular cavity enclosed by

motor body means, and wherein the interior of said annular cavity is in communication with the exterior of said motor through a plurality of holes extending through said motor body means;

a seal ring superposed on the back of said turbine rotor in concentric relation, and hole means provided in said rotor for balancing pressures on both sides of said seal ring; and

a back chamber provided at the back of said seal ring on the opposite side thereof from said turbine rotor, said back chamber communicating with the exterior of said motor by hole means extending from said back chamber through said casing.

4,505,639

AXIAL-FLOW TURBINE BLADE, ESPECIALLY AXIAL-FLOW TURBINE ROTOR BLADE FOR GAS TURBINE ENGINES

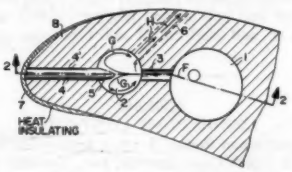
Helmut Groess, Esterhofen, and Horst Graeml, deceased, late of Markt Indersdorf, both of Fed. Rep. of Germany (by Edith Graeml, administrator), assignors to MTU Motoren-Und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,171

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211139

Int. Cl.³ F01D *5/18*

U.S. Cl. 416—97 R **13 Claims**



1. An axial flow turbine blade having a leading edge, comprising a first cooling fluid flow channel (1) extending substantially radially in the blade for supplying a cooling fluid into the blade, a second cooling fluid flow channel (2) also extending substantially radially in the blade between said first channel (1) and said leading edge for cooling especially said leading edge, a plurality of impingement ducts (3), each duct having a first longitudinal axis and interconnecting said first channel (1) with said second channel (2) for supplying cooling fluid from said first channel (1) into said second channel (2) through said ducts (3), whereby cooling fluid is projected into said second channel, a plurality of elongated cooling pins (4) of heat conducting material extending through the blade substantially from said leading edge and into said second chamber (2), each of said cooling pins (4) having a second longitudinal axis extending in axial alignment with the respective first longitudinal axis, each of said cooling pins (4) further having a free end reaching into said second channel (2) in the direction of said first and second longitudinal axes so that cooling fluid from said ducts (3) is aimed to axially impinge on said free ends of said cooling pins (4) for causing a symmetrical spacial dispersion of the cooling fluid enabling the cooling fluid to contact all surface areas of said cooling pins and of said second channel for an improved cooling action, at least said second channel (2) having wall surfaces positioned for deflecting the spacially dispersed cooling fluid, and further duct means (6) extending out of said second channel (2) for discharging cooling fluid out of said blade.

4,505,640

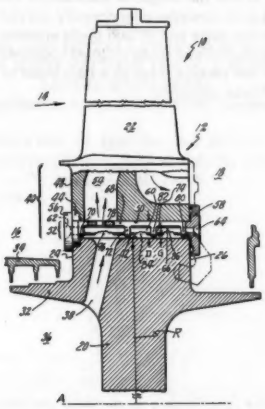
SEAL MEANS FOR A BLADE ATTACHMENT SLOT OF A ROTOR ASSEMBLY

Frederick F. Hsing, Windsor, and John A. Leogrande, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 13, 1983, Ser. No. 561,016

Int. Cl.³ F01D *5/18, 5/30*

U.S. Cl. 416—97 R **10 Claims**



1. In a coolable rotor assembly of the type adapted for use in an axial flow rotary machine having a flow path for hot working medium gases, the rotor assembly including a coolable rotor disk extending circumferentially about an axis, the rotor disk having a plurality of circumferentially spaced blade attachment slots each bounded by a first sidewall, a bottom wall and a second sidewall of the disk, and having a plurality of passages for cooling air, a passage at each slot extending from a source of cooling air to the slot, and including an array of rotor blades, one blade at each slot which extends from the slot, each blade having a root which is spaced radially from the bottom wall of the slot leaving a cavity therebetween and having a passage for cooling air in flow communication with the blade attachment slot, the improvement which comprises:

a seal means for a blade attachment slot which has

a first element disposed in the cavity which extends axially and laterally in the cavity to block the leakage of cooling air from the cavity in the radial direction,

at least two baffles spaced axially one from the other which are integral with the first element and which extend radially and laterally across the cavity into close proximity with the bottom wall of the disk bounding the cavity to define a chamber for cooling air which is in flow communication with the passage for cooling air in the disk, and

an orifice for cooling air in the first element which extends between the baffles to place the chamber in flow communication with the passage for cooling air in the blade.

4,505,641

COOLING FAN FOR INTERNAL COMBUSTION ENGINE

Shunzo Tsuchikawa, Ichinomiya; Masaharu Hayashi, and Takanobu Hori, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 240,904, Mar. 5, 1981, abandoned. This application Dec. 22, 1983, Ser. No. 564,361

Claims priority, application Japan, Mar. 7, 1980, 55-30082[U]

Int. Cl.³ F04D *29/38*

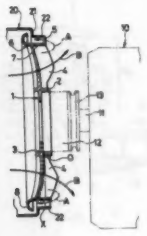
U.S. Cl. 416—189 **2 Claims**

1. A cooling fan located in association with a radiator of an

internal combustion engine and having a plurality of radially extending blade elements around a boss portion for passing cooling air through said radiator, said fan comprising:

a cylindrical ring member provided coaxially with the rotational axis of the fan and connecting outer end portions of said blade elements; and

a base line connecting base points in airfoil sections of each of said blade elements on chords thereof located between a leading edge and a trailing edge of the airfoil section at a point 2/5ths the length of each chord from the leading edge so as to describe a moderately curved line from the inner to the outer end of said blade elements in a plane of rotation thereof and being inclined rotationally forward of a radial line passing through a base point at the inner end of said blade elements;



said base line describing a moderately curved line from the inner to the outer end of said blade elements in a plane containing the rotational axis of said blade elements and inclined toward a suction side from said plane of rotation of said blade elements;

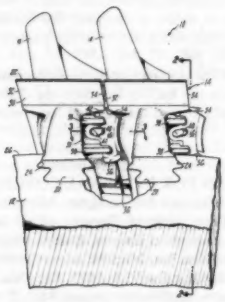
a leading edge portion of the outer end of each of said blade elements being secured to said ring over a length corresponding to ¼ to ¾ of the width of said outer blade end as projected perpendicularly to the rotational axis of the fan, a remainder of the outer blade end forming a free end portion, and the trailing edges of said blade elements projecting on the discharge side of said ring and the end portion on the suction side of said ring diverging radially outward and then bending toward a discharge side of the fan.

4,505,642

ROTOR BLADE INTERPLATFORM SEAL

Edward C. Hill, Tequesta, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 24, 1983, Ser. No. 544,933
Int. Cl.³ F01D 5/22
U.S. Cl. 416—193 A **5 Claims**



1. A rotor assembly comprising:

a disk having a rim and an axis, said rim including root slot means;

a plurality of blades, each having a root disposed in said root slot means, wherein said blades are circumferentially and uniformly spaced about the periphery of said disk, each blade having a platform spaced radially outwardly of said rim, each platform having a first and second axially extending edge, said first edge of each platform being adjacent and aligned with said second edge of the platform of an adjacent blade defining a narrow gap therebetween, each platform also having a radially inwardly facing first undersurface portion adjacent said first edge and second undersurface portion adjacent said second edge, each blade including slot forming means having radially outwardly facing surfaces closely spaced from and facing said first undersurface portion of its respective blade defining at least one seal slot therebetween, said seal slot having an opening facing in the direction of said first edge of its respective blade platform, said platform including a lug adjacent said seal slot and extending radially inwardly from said first undersurface portion of said platform; and

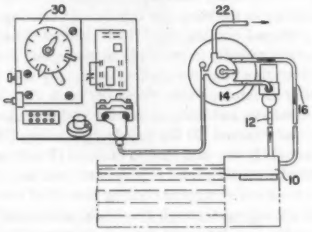
a sheet metal seal between each pair of adjacent blades, each seal having a first portion contoured to substantially the shape of said first undersurface portion of one of said pair of blades and overlying the said first undersurface portion, said seal first portion being disposed within said seal slot of said one of said blades and having an opening therethrough through which said lug extends, wherein said lug traps said seal within said seal slot, said seal also having a second portion extending beyond said first edge and contoured to substantially the shape of said second undersurface portion of said blade platform of said other one of said pair of blades, wherein said trapped seal bridges the gap between said adjacent platform edges of said pair of blades such that said seal second portion overlies said second portion of said platform of said other one said pair of blades.

4,505,643

LIQUID PUMP CONTROL

Donald E. Millis, and Rodger J. Grys, both of Norwalk, Ohio, assignors to North Coast Systems, Inc., Norwald, Ohio

Filed Mar. 18, 1983, Ser. No. 476,813
Int. Cl.³ F04B 49/00
U.S. Cl. 417—12 **5 Claims**



1. A control circuit for controlling cyclic operation of a circulation pump, the control circuit comprising:

an intermittent actuating means for intermittently producing a pump signal, the intermittent actuating means being operatively connected with the circulation pump for pumping a circulation fluid through a fluid receiving apparatus, the intermittent actuating means including a first timer for producing the pump signal at selected, regular intervals;

a pressure monitor for monitoring the pressure of the circulating fluid; and,

a low pressure shutdown means for terminating operation of the circulating pump unless the monitored circulation

fluid pressure attains a first preselected pressure within a preselected time period, the low pressure shutdown means includes,

A. a second timer which is operatively connected with the first timer to be actuated by the pump signal to commence timing said preselected time period, the second timer causing a time controlled switching means to conduct the pump signal for the preselected time period; and,

B. a pressure controlled low pressure switch which passes the pump signal around the time controlled switching means in response to the monitored circulation fluid pressure exceeding the first preselected pressure such that the circulation pump continues to be activated by the pump signal; and,

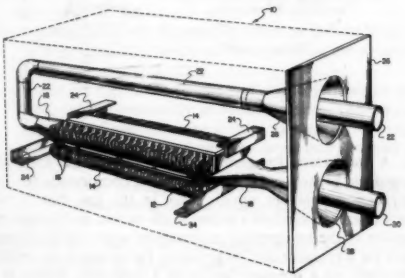
C. a bypass switch connected electrically in series with the time controlled switching means, the pressure controlled low pressure switch bypassing the bypass switch and the time controlled switching means, the bypass switch conducting the pump signal in response to sensing a pressure below a second preselected pressure, the second preselected pressure meeting or exceeding the first preselected pressure such that the pressure controlled low pressure switch closes as or before the bypass switch opens.

4,505,644

LINEAR INDUCTION PUMP

John W. Meisner, Newbury Park; Robert M. Moore, Canoga Park, and Louis L. Bienvenue, Chatsworth, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 6, 1982, Ser. No. 447,081
Int. Cl.³ H02K *44/06*
U.S. Cl. 417—50 **8 Claims**



1. An electromagnetic linear induction pump for liquid metal comprising:

a unitary pump duct, said duct comprising:

two substantially flat parallel spaced-apart wall members, said wall members being located one above the other,

two parallel opposing side members interconnecting said wall members;

a plurality of web members located within said duct interconnecting said wall members and extending parallel to said side members, and said wall members, side members and web members defining a plurality of substantially square fluid passageways for the flow of liquid metal therethrough, each of said fluid passageways having substantially the same cross-sectional flow area;

a multi-phase electrical stator located adjacent each of said wall members;

an electrically conductive end bar attached to an outer surface of each of said side members;

a housing enclosing said pump duct, stators and end bars, said housing having an inlet and an outlet in fluid communication with opposite ends of the fluid passageways in said pump duct, said inlet and outlet including a transition means providing a transition from a round cross-sectional flow path to a substantially rectangular cross-sectional flow path and further including guide vanes located in said inlet transition means for directing a substantially equal flow of fluid to each of the passageways in said pump duct; and

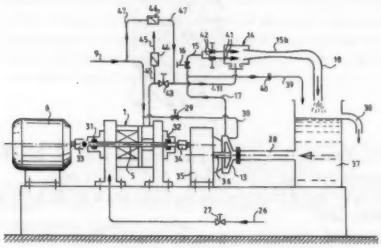
a body of thermal insulation located intermediate each of said stators and said pump duct.

4,505,645

PROCESS AND INSTALLATION FOR RAPIDLY CREATING A HIGH VACUUM USING A SINGLE STAGE LIQUID RING PUMP

Pierre R. Laguilharre, 6, rue Robin, 95880 Enghien les Bains, France

Filed Feb. 10, 1982, Ser. No. 347,430
Claims priority, application France, Feb. 13, 1981, 81 02929
Int. Cl.³ F04C *19/00*
U.S. Cl. 417—69 **13 Claims**



1. An installation for rapidly evacuating an enclosure, comprising a first compression stage unit formed by a liquid ring vacuum pump; a second compression stage unit; each of said units including a suction duct and a discharge duct, the suction duct of the first compression stage unit being in connection with the enclosure to be evacuated, the discharge duct of the first compression stage unit being in communication with the suction duct of the second compression stage unit and the discharge duct of the latter being in communication with the atmosphere; and means for instaneously enabling the second compression stage unit to cooperate in series with the first compression stage unit when a predetermined reduced pressure has been established by the first compression stage unit in the enclosure to be evacuated and for instanteously preventing the second compression stage unit to cooperate in series with the first compression stage unit when the pressure in said enclosure is higher than said predetermined reduced pressure.

4,505,646

EDUCTOR PUMP AND PROCESS

Nathan R. Long, Grosse Ile, and Howard L. Anderson, Southgate, both of Mich., assignors to Diversey Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 15, 1982, Ser. No. 441,607
Int. Cl.³ F04F *5/00*
U.S. Cl. 417—172 **9 Claims**

1. An eductor pump for withdrawing a feed liquid product from a container, comprising:

a tubular body having a converging nozzle mounted inside and near the lower end of the tubular body;

conduit means for feeding a drive liquid to the converging nozzle so that the drive liquid can flow through the converging nozzle and be directed upwardly in the tubular body;

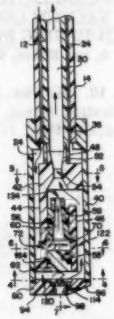
a feed liquid access opening in the lower end of the tubular body and a passageway from said access opening to the upstream side of the converging nozzle whereby feed

liquid can be inspirated into upward flow, and admixture with, a stream of drive liquid flowing out of the converging nozzle;

means to remove a mixed stream of feed liquid and drive liquid from the upper part of the tubular body;

a removable plate, having top and bottom surfaces, attached to the lower end of the tubular body;

the plate bottom surface having a planar portion lateral to the plate axis and a planar portion sloped about 15° to 30° from a plane normal to the plate axis;



a hole through the plate communicating with the feed liquid access opening in the tubular body lower end;

a one way valve mounted on the plate to close the hole in the plate; and

mechanical fastener means, accessible from outside the pump, removably securing the plate to the lower end of the tubular body so that the plate can be removed and the valve thereon readily replaced.

4,505,647

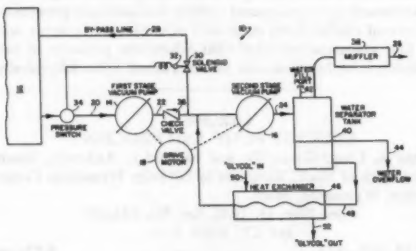
VACUUM PUMPING SYSTEM

Robert E. Alloca, Melville, and Meyer I. Mazon, Flushing, both of N.Y., assignors to Grumman Allied Industries, Inc., Melville, N.Y.

Continuation of Ser. No. 872,613, Jan. 26, 1978, abandoned. This application Apr. 7, 1980, Ser. No. 138,238

Int. Cl.³ F04B *49/08*

U.S. Cl. 417—252 **4 Claims**



1. A vacuum pumping system for evacuating a container comprising:

a pumping system having at least first stage and second stage pumps and an interstage line therebetween connecting the output of said first pump with the input of said second pump;

a motor for driving said pumps;

a by-pass line connecting said interstage line with said container for returning selectively at least some of the output of said first pump to said container;

valve means in said by-pass line for opening or closing said by-pass line;

an intake line for the passage of fluid between said container and the input of said first stage pump; and

pressure-sensitive switching means in said intake line responsive to absolute pressure for actuating said valve means in response to a preset absolute pressure level to close said valve when said container is evacuated to said preset absolute pressure whereby, when said valve is open, interstage pressure is relieved back to said container such that the power requirements of said system are minimized during the initial pressure pull-down of said container and whereby, when said valve is closed when said preset pressure is reached, said two stages work together to pump down efficiently said container to a desired absolute pressure below said preset pressure.

4,505,648

UNLOADING MECHANISMS FOR AIR COMPRESSORS

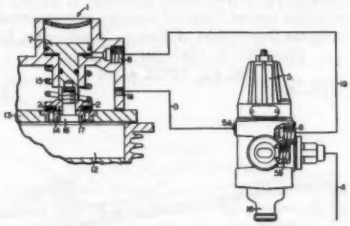
Werner Heger, Lehrte-Kolshorn; Wolfgang Kaltenthaler, and Helmut Wilke, both of Wennigsen, all of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 416,831

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3136948

Int. Cl.³ F04B *49/02*

U.S. Cl. 417—297 **4 Claims**



1. A mechanism for generation of pressure gas for a compressed air brake system comprising, a compressor having a compression chamber which takes in the gas that is to be compressed and exhibits a pressure gas outlet, the compression chamber of the compressor is connected with the pressure gas outlet via a pressure discharge valve, the pressure gas outlet is connected via a pressure line with a consumer which is designed as a storage tank, a pressure regulating system which switches the compressor from a compression phase to an unloading phase when a certain predetermined pressure is reached, the compressor is equipped with a first pneumatic control connection for opening the pressure discharge valve and for opening means associated with the pressure discharge valve to reduce the pressure head on the compressor during the unloading phase, and the first pneumatic control connection of the compressor is connected with a pneumatic control outlet of the pressure regulating system an operating piston is provided in the compressor for the opening of the pressure discharge valve, said piston is operated by the pressure which is supplied to the first pneumatic control connection, the pressure discharge valve includes a pressure disk that is arranged between a valve support plate and a valve catcher, the valve catcher serves the purpose of supporting the pressure disk against the forces that are a result of the compressed gas acting upon the pressure disk, the operating piston is connected to the valve catcher so that during the unloading phase the valve catcher can be moved away from the valve support plate against the force of a spring, and the force of the spring is sufficient to prevent movement of the valve catcher by the pressure of the compressed gas during the compression phase,

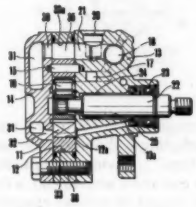
and the valve support plate includes a part for supporting the pressure disk and is movable toward the open direction of the pressure disk so that a larger opening is formed during the unloading phase, and the operating piston is adapted to move the movable part relative to the valve support plate.

4,505,649

VANE PUMPS

Kosaku Masuda, Kawagoe, and Shuichirow Tashiro, Higashimatsuyama, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,566
Claims priority, application Japan, Sep. 25, 1981, 56-152433
Int. Cl.³ F04C *2/00, 15/00*
U.S. Cl. 417—300 **3 Claims**



1. An axial flow vane pump comprising:
a rotor including radially slidable vanes;
a cam ring having an eccentric opening accommodating said rotor to form pump chambers;
a front body and a rear body secured to both sides of said cam ring for defining said pump chambers together with said cam ring; and
an intermediate body disposed between said front body and said rear body and having an inner opening for accommodating said cam ring;
a portion of said inner opening of said intermediate body being bulged outwardly to form together with an outer periphery of said cam ring a fluid passage for conveying operating fluid axially from said front body to said rear body;
said front body having inlet and outlet ports with said inlet port communicating with a passage aligned with said fluid passage;
said rear body having an axial passage aligned with said fluid passage and an arcuate passage for conveying working fluid from said axial passage to an axial suction port open to communicate with said pump chambers;
said front body having an axial port in communication between the high pressure outlet of said pump chambers and a high pressure chamber in said front body which delivers working fluid to a valve opening therein for passage to a discharge port and recirculates excess fluid to mix with operating fluid at said inlet port.

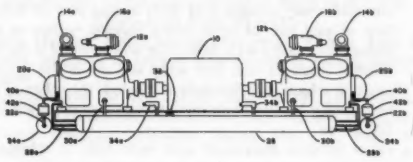
4,505,650

DUPLEX COMPRESSOR OIL SUMP

William J. Hannett, Jamesville, and David S. Wilson, Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 5, 1983, Ser. No. 520,658
Int. Cl.³ F04B *39/02, 23/06*
U.S. Cl. 417—426 **4 Claims**

1. A duplex compressor arrangement in which a pair of compressors are axially aligned with and driven by a motor with the axial alignment having a variable steady state orientation of ±5° from horizontal comprising:
oil sump means at a lower elevation than said compressors and including a tube assembly extending into said sump means and having at least one inlet opening therein;
a pair of oil pump means for feeding oil to each of said compressors and having suction lines fluidly connected to said tube assembly and fluidly communicating with the oil in said oil sump means via said at least one inlet opening;
a pair of return lines connected to each of said compressors



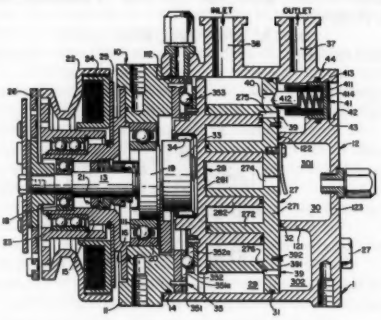
and said oil sump means for draining excess oil from said compressors;
a pair of equalizing lines connected to each of said compressors and said oil sump means for equalizing pressure in each of said compressors and said oil sump means and for serving as a secondary drain for draining excess oil which tends to accumulate in said compressors when oriented in an other than horizontal position.

4,505,651

SCROLL TYPE COMPRESSOR WITH DISPLACEMENT ADJUSTING MECHANISM

Kiyoshi Terauchi, Gunma; Akihiro Kawano, Maebashi, and Atsushi Mabe, Gunma, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Aug. 8, 1983, Ser. No. 521,258
Claims priority, application Japan, Aug. 7, 1982, 57-137650
Int. Cl.³ F01C *17/06, 1/02;* **F04C** *18/02, 29/08*
U.S. Cl. 417—440 **4 Claims**



1. In a scroll type fluid compressor including a housing having a fluid inlet port and a fluid outlet port, a fixed scroll fixedly disposed within said housing and having a circular end plate from which a first wrap extends into the interior of said housing, an orbiting scroll having a circular end plate from which a second wrap extends, said first and second wraps interfitting at angular and radial offsets to form a plurality of line contacts to define at least one pair of sealed off fluid pockets, a driving mechanism operatively connected to said orbiting scroll to effect the orbital motion of said orbiting scroll by rotation of a drive shaft and rotation preventing means for preventing the rotation of said orbiting scroll during orbital motion to thereby change the volume of the fluid pockets, the improvement comprising:
said end plate of said fixed scroll partitioning the interior of said housing into a first chamber in which said first wrap extends and a second chamber;

a partition wall disposed within said second chamber to provide an outer peripheral chamber and a central chamber;

at least one pair of holes formed through said end plate of said fixed scroll to form a fluid communication channel between the pair of fluid pockets and said outer peripheral chamber, said pair of holes being located at symmetrical locations along said first wrap so that said second wrap simultaneously crosses over both of said pair of holes, a first of said pair of holes being located within an area defined by $\phi end > \phi 1 > \phi end - 2\pi$ where ϕ end is the final infolute angle of said first wrap and $\phi 1$ is the involute angle at which said first hole is located, the other of said holes being located at an involute angle of approximately 100 $1 - \pi$;

a valve member associated with each hole to selectively control the opening and closing of said pair of holes;

a communicating hole formed through said end plate of said fixed scroll to form a fluid communication channel between said first chamber and said outer peripheral chamber, said communicating hole being located at the outside of a terminal end of said first wrap; and

control means for selectively controlling the opening and closing of said communicating hole to permit fluid communication therethrough.

4,505,652

SPHERICAL PISTON PUMP

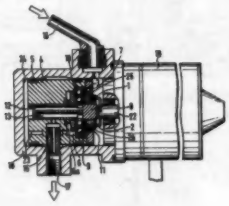
Jochen Burgdorf, Offenbach, and Ludwig Budecker, Frankfurt, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,370

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1981, 3139561

Int. Cl.³ F04B *19/02*; F01B *13/04*

U.S. Cl. 417—462 **10 Claims**



1. A radial piston pump comprising an outer stator, an inner rotor rotatable on a control pintle having supply and discharge channels, said rotor including a radial bore in which a piston is slidable, said piston including a first ball disposed to roll on a cam surface associated with said stator, said piston further including a second ball and a sleeve therebetween with said sleeve spacing said second ball from said first ball with an axial passageway through said sleeve, said sleeve further including a first inclined wall in contact with said first ball and a second inclined wall in contact with said ball, the inward end of each of said inclined walls directed to said axial passageway, said first and second balls being of essentially the same diameter, and wherein said sleeve is of low friction material, wherein said sleeve is in operative sliding relation with both said balls but is not mechanically connected thereto and wherein there is a radial bore through said sleeve connecting said axial passageway with the sleeve outer periphery.

4,505,653

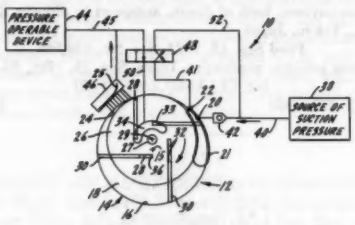
CAPACITY CONTROL FOR ROTARY VANE COMPRESSOR

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 27, 1983, Ser. No. 498,998

Int. Cl.³ F04C *29/10*

U.S. Cl. 418—23 **5 Claims**



1. A control arrangement for a rotary vane fluid displacement apparatus including a fluid control valve, which valve comprises a valve housing having a longitudinal reference axis and defining a first end and a second end, a first or slide chamber and sidewall, a second or bellows chamber and a connecting channel between said first and second chambers;

said valve housing being sealed at said first end by a plug defining a stub-stop protruding into said first chamber along said reference axis, said second chamber being sealed at said housing second end by a seal means and an adjustable threaded plug;

a slide, coaxial with said longitudinal reference axis, and slidably operable in said first chamber defining a first land, a second land and a third land with a first and second cylindrical segments and groove segments, respectively, therebetween;

said valve housing first end, slide valve bore sidewall and first land of said slide cooperating to define a bias spring chamber therebetween;

said slide further defining a protuberance extending into said spring chamber from said first land longitudinally toward said stub-stop;

a bias spring positioned in said spring chamber between said first end of said valve housing and said first land to bias said slide;

an expandable bellows mounted in said second chamber contacting said threaded plug and including an extension member with a protruding head end extending into said connecting channel and slidable therein by said bellows;

said valve housing further defining a discharge port, a suction pressure port, a compression chamber port and a valve control port which communicate, in that order, between said first chamber and a pressure operable device, a source of suction pressure, said second inlet connecting means and said fluid displacement control cavity;

said valve housing further defining an annulus in said connecting channel and a first passage means communicating between said discharge port and said annulus;

said bellows extension member defining a through-hole alignable with said annulus of said connecting channel when said bellows is compressed;

said bellows extension member further defining a longitudinal passage means communicating between said extension member head end and said extension member through-hole;

said slide defining a cross-hole in said second cylindrical segment and a bore passage means communicating between said cross-hole and said spring chamber; and

wherein said fluid control valve is operable to communicate discharge or suction pressure to said control cavity in

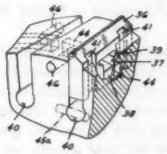
response to the differential between said discharge and suction pressures when such differential is great enough to overcome the bias force of said spring to thus provide a means to transfer discharge pressure from said valve control port to said compression chamber port and to simultaneously introduce suction pressure to said valve control port.

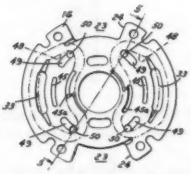
4,505,654

ROTARY VANE DEVICE WITH TWO PRESSURE CHAMBERS FOR EACH VANE

Laurence C. Dean, Jr., Lake Orion, and Louis J. Cardinale, Utica, both of Mich., assignors to Vickers Incorporated, Troy, Mich.

Filed Sep. 1, 1983, Ser. No. 528,416
Int. Cl.³ F01C *1/00, 19/08*
U.S. Cl. 418—80 **3 Claims**





1. A fluid pressure energy translating device of the sliding vane type comprising

a cam body including an internal contour,

a rotor, a plurality of vanes rotatable with said rotor and slidable relative thereto in slots in the rotor, one end of each vane engaging said internal contour, said rotor and internal contour cooperating to define one or more pumping chambers between the periphery of the rotor and the cam contour through which the vanes pass carrying fluid from an inlet port to an outlet port,

at least one cheek plate associated with said body and rotor,

means forming two pressure chambers for each vane, each vane having two surfaces, one in each chamber, both being effective under pressure in said respective chambers to urge the vanes into engagement with the internal contour,

a generally annular internal feed passage formed entirely within said rotor communicating with one set of said pressure chambers,

each said vane having inner and outer ends and sides,

the inner end of each said vane defining the surface of one of said pressure chambers,

a radial passage on each said vane extending from the inner to the outer ends thereof,

an arcuate valving groove formed in the cheek plate in an outlet fall zone or high pressure zone alongside said rotor,

axial openings in said rotor extending from a side of said rotor to said annular passage and adapted to register with said arcuate valving groove as the rotor rotates relative to said cam body,

an arcuate groove in the face of the cheek plate solely in the dwell zone,

said arcuate groove being concentric with the arcuate valving groove and adapted to register with the chamber associated with the axial openings as the rotor rotates,

and a hydrostatic pressure pad associated with the opposite face of the cheek plate and circumscribing the arcuate valving groove and the arcuate groove, an opening extending from the arcuate groove through the cheek plate to the hydrostatic pad area,

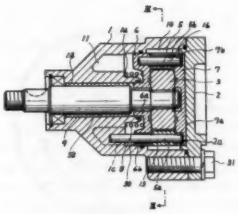
said arcuate groove lying solely within said hydrostatic pressure pad.

4,505,655

VANE PUMP WITH POSITIONING PINS FOR CAM RING AND SIDE PLATES

Susumu Honaga, Aichi, and Satoshi Sutoh, Chiryu, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 331,757, Dec. 17, 1981, abandoned. This application Mar. 5, 1984, Ser. No. 584,306
Claims priority, application Japan, Dec. 27, 1980, 55-187552[U]
Int. Cl.³ F04C *2/00, 15/00*
U.S. Cl. 418—133 **2 Claims**



1. A vane pump for a power steering device comprising:

a pump housing having an inner bore;

an end cover secured to said pump housing for covering an open end of said inner bore of said pump housing and having an inner end bore at an inner end thereof;

a cam ring received in said inner bore of said pump housing and having an internal cam bore;

a first side plate fitted in said inner bore of said pump housing for defining a pressure chamber between one side surface thereof and an inner end wall of said pump housing and disposed in contact relationship at the other side surface thereof with one side surface of said cam ring;

a second side plate fitted in said inner end bore of said end cover and disposed in contact relationship with the other side surface of said cam ring;

a drive shaft rotatably carried by said pump housing and extending into said internal cam bore;

a pump rotor carried on said drive shaft for integral rotation therewith and received in said internal cam bore;

a plurality of vanes radially slidably carried on the periphery of said pump rotor for contacting said internal cam bore to define a plurality of pump chambers therewith;

a first positioning pin fitted at one end thereof into said inner end wall of said pump housing and passing through a first elongated hole formed in said first side plate and a hole formed in said cam ring in fitted relationship therewith and received at the other end thereof in a second elongated hole formed in said second side plate for positioning said first and second side said plates in a circumferential direction thereof, said first and second elongated holes being elongated in a radial direction and the width thereof along the radial direction being in fittable relationship with said first positioning pin; and

a second positioning pin fitted at one end thereof into one of said first and second side plates and passing through a third elongated hole formed in said cam ring and received at the other end thereof in a fourth elongated hole formed in the other of said first and second side plates for positioning said cam ring against movement within a plane trans-

verse to the axis of said drive shaft in cooperation with said first positioning pin, said third and fourth elongated holes being elongated in a radial direction and the width thereof along the radial direction being in fittable relationship with said second positioning pin, said second positioning pin being prevented from extending into said pressure chamber.

4,505,656

VANE COMPRESSOR, PARTICULARLY A COOLING MEDIUM COMPRESSOR FOR USE IN AIR-CONDITIONING EQUIPMENT OF A VEHICLE

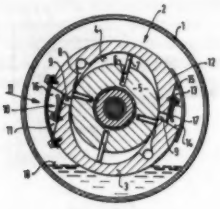
Gerhard Adalbert, Stuttgart, and Theodoros Vysiotis, Bühl-Eisenthal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 6, 1984, Ser. No. 568,804

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1983, 8305665[U]

Int. Cl.³ F16K *15/16*; F04C *2/00*

U.S. Cl. 418—270 **5 Claims**



1. A rotary vane compressor, particularly for a cooling medium for use in air-conditioning installation of a vehicle, comprising an outer housing wall and an inner housing cylindrical wall radially spaced from each other, said inner wall having an endless inner surface; a rotor disposed in said inner wall and having an outer surface, said rotor forming between the outer surface thereof and said inner surface of said inner wall at least one working chamber having a low pressure portion and a high pressure portion, said rotor having a plurality of radial slots; a plurality of vanes positioned in said slots and slidingly engaging said inner surface of the inner wall to subdivide said working chamber into a plurality of medium-conveying cells; inlet means opening into said low pressure portion; at least two medium-outlet bores formed in said inner wall and connected to the high pressure portion and arranged at said inner surface of said inner wall, each of said bores being provided with a pressure valve normally closing the outlet bore, said inner wall having an outer side and formed with at least two recesses open at said outer side and each accommodating a respective pressure valve, each of the outlet bores being connected to a respective recess, said inner wall being formed with reinforcing ribs formed according to an original thickness of said inner wall, each recess being separated from a neighboring recess by a respective reinforcing rib.

4,505,657

APPARATUS FOR FORMING BLOWN FILMS

Nobushige Ikeya, Tokyo, Japan, assignor to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 436,366, Oct. 25, 1982, abandoned. This application Jun. 26, 1984, Ser. No. 624,791

Claims priority, application Japan, Oct. 30, 1981, 56-174350; Jul. 21, 1982, 57-127058

Int. Cl.³ B29C *25/00*

U.S. Cl. 425—72 R **24 Claims**

1. Apparatus for forming a blown film comprising:

(a) an inflation forming die having a circular slit,

(b) an air ring surrounding the circular slit of said die and provided with an air flow passage leading to an air ejecting slit,

(c) said air ring being mounted on said die without any appreciable gap,

(d) said air ejecting slit being defined by an outer lip having a tapered surface, the inner diameter thereof increasing in a direction of withdrawal of a cylindrical film extruded through said circular slit, and an inner lip disposed closer to said die than said outer lip, and

(e) means for reducing air pressure in a space between said inner lip and said cylindrical film inwardly of said air ejecting slit, said air pressure reducing means including:

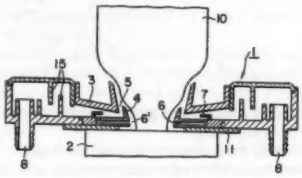
(i) an air suction passage one end of which opens in said space and the other end of which opens in said air flow passage in said air ring and

(ii) Venturi tube effect creating means for reducing air pressure in said space through said air suction passage.

12. Apparatus for forming a blown film, said apparatus comprising:

(a) an inflation forming die having a circular slit;

(b) an air ring surrounding the circular slit of said die downstream of said die and being mounted on said die without any appreciable gap between said die and said air ring, said air ring being provided with an air flow passage leading to an annular air ejecting slit, said annular air ejecting slit being defined by:



(i) an inner lip disposed downstream of said die, whereby a first annular empty chamber is formed during the extrusion of a blown film, said first annular empty chamber being bounded at least in part by said die, said inner lip, and the exterior of said film being blown, and

(ii) an outer lip disposed downstream of said inner lip and radially outwardly of said inner lip; and

(c) means for reducing air pressure in said first annular empty chamber, said means including:

(i) an air suction passage one end of which opens in said first annular empty chamber and the other end of which opens in said air flow passage in said air ring and

(ii) means for creating an under-pressure in said air suction passage, said means comprising means for creating a Venturi tube effect in said air flow passage, thereby creating an under-pressure region in said air flow passage, said air suction passage communicating with the under-pressure region in said air flow passage, thereby communicating the under-pressure in said air flow passage to said first annular empty chamber, the under-pressure in said first annular empty chamber serving to attract the exterior of said film being blown radially outwardly, whereby said film being blown is moved downstream with its diameter increased to some extent.

4,505,658

MECHANISM FOR CENTERING REINFORCING MESH

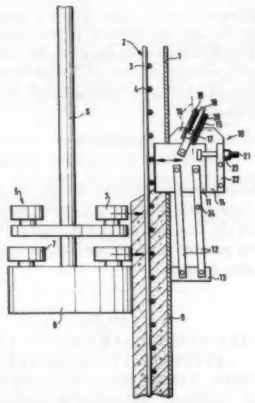
Werner Müller, Ettlingen, Fed. Rep. of Germany, assignor to Maschinenfabrik Ettlingen Friedrich Pfeiffer KG, Ettlingen, Fed. Rep. of Germany

Filed Nov. 15, 1983, Ser. No. 551,825

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1983, 3312396

Int. Cl.[3] **B28B** *7/02, 21/56*

U.S. Cl. 425—117 **20 Claims**



1. An apparatus for centering a reinforcing mesh standing in a pipe form for the manufacture of reinforced concrete pipe or conduit comprising:

a plurality of centering units distributed at equal spaced intervals around a perimeter of a form for making concrete pipe, each said unit comprising at least one centering member projecting into said form radially from the outside, the depth of penetration of said member into said form being adjustable as a function of outer diameter of said reinforcing mesh, said member being adapted to be taken into a retracted position of rest from its working position during which it bears against said reinforcing mesh as the concrete introduced in said form is being compacted, wherein each centering member of said centering units has associated with it a spring for supporting and actuating said member in a manner such as to pass an unstable dead-center position each time it is taken from its working position into its position of rest, or from its position of rest to a working position.

4,505,659

APPARATUS FOR MANUFACTURING A CONTINUOUS SLIDE FASTENER STRINGER

Toshio Chijiishi, Namerikawa; Hiroshi Matoba, Toyama; Kazuo Nakamura, Uozu, and Toshiaki Higuchi, Kurobe, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 556,105

Claims priority, application Japan, Nov. 30, 1982, 57-210296

Int. Cl.[3] **B29D** *5/00, 3/00;* **B29F** *1/00*

U.S. Cl. 425—121 **3 Claims**

1. An apparatus for manufacturing a continuous slide fastener stringer including a continuous stringer tape and a plurality of longitudinally spaced rows of injection-molded coupling elements secured to the stringer tape along a longitudinal edge thereof with a plurality of element-free portions between the successive rows of injection-molded coupling elements, said apparatus comprising:

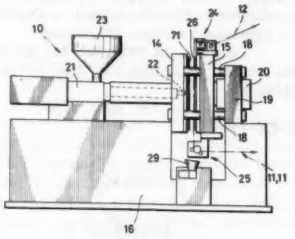
(a) a frame;

(b) a pair of relatively movable mold members supported on said frame and defining a series of mold cavities, said mold members having a pair of mating mold surfaces, respectively,

(c) a power-driven feed mechanism for intermittently feeding the stringer tape by a predetermined length;

(d) a first feeler disposed on one of said mold members adjacent to a leading one of said mold cavities and projecting from the mold surface of said one mold member toward said mold surface of the other mold member for detecting a trailing end of the injection-molded coupling elements;

(e) a second feeler movably disposed on said one mold member downstream of said first feeler for detecting the trailing end of the row of injection-molded coupling elements, said second feeler being spaced from said first feeler by a distance substantially the same as the length of the element-free portions and being movable to project and retract from the mold surface of said one mold member; and



(f) a driving mechanism operatively connected to said feed mechanism for driving said second feeler to selectively project or retract from the mold surface of said one mold member in response to completion of the feed of the stringer tape by said feed mechanism.

4,505,660

APPARATUS FOR MAKING A ONE-PIECE, WASHABLE AND STERILIZABLE PLASTIC SHOE

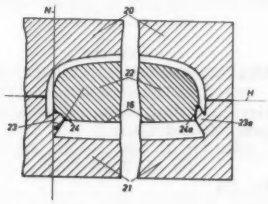
Hartmut Seidel, Hamburg, and Winrich B. Hammerschmidt, Schenefeld, both of Fed. Rep. of Germany, assignors to NATEC Institut, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 171,666, Jul. 24, 1980,. This application Mar. 3, 1982, Ser. No. 354,225

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1979, 2930807

Int. Cl.[3] **B29F** *01/00;* **B29C** *06/04;* **A43B** *07/06*

U.S. Cl. 425—129 S **16 Claims**



13. An apparatus for producing a one-piece, washable and sterilizable plastic shoe comprising:

a mould having a bottom-half mould, and a moveable top-half mould, and a shoe last located therebetween to form an entire shoe,

said bottom-half mould having spaced pins extending therefrom into engagement with said last to form lateral venti-

lating openings in the shoe, said pins being upwardly and inwardly directed from said bottom-half mould towards said last,

each of said pins having the top of the base thereof extending from said bottom-half mould lower than the top of the distal end thereof in engagement with said last and having the bottom of the base thereof extending from said bottom-half mould lower than the bottom of the distal end thereof in engagement with said last.

4,505,661

INJECTION PRESS

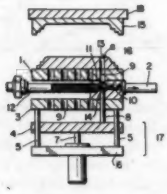
Friedrich B. Bielfeldt, Eppingen-Muehlbach, Fed. Rep. of Germany, assignor to Maschinenfabrik J. Dieffenbacher GmbH & Co., Eppingen, Fed. Rep. of Germany

Filed Sep. 10, 1982, Ser. No. 416,705

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1981, 3136419

Int. Cl.³ B29C *1/00*

U.S. Cl. 425—190 **11 Claims**



1. An injection press for forming a mass of plastic material to a desired shape comprising:

a die carrier plate for supporting a mold having an injection channel formed therein at a desired injection point, said die carrier plate having a plurality of bores therethrough arrayed in an X-Y coordinate field;

a press plate parallel to said die carrier plate and having a plurality of bores therethrough aligned with the bores in said die carrier plate in said X-Y coordinate field;

injecting means interposed between said die carrier plate and said press plate for injecting plastic material into a mold, said injecting means comprising a single injection nozzle;

a closing rod extendable through a desired pair of aligned bores in said die carrier plate and said press plate, through said interposed injecting means and through the injection channel of a mold on said die carrier plate to force plastic material into the mold;

said injection means and said closing rod being selectively positionable in said X-Y coordinate field so that the closing rod will pass through a selected, desired pair of aligned bores in said die carrier plate and said press plate most closely corresponding to the location of the desired injection point of a mold on said die carrier plate.

4,505,662

APPARATUS FOR THE FLEXIBILIZATION OF SYNTHETIC RESINOUS FOAM

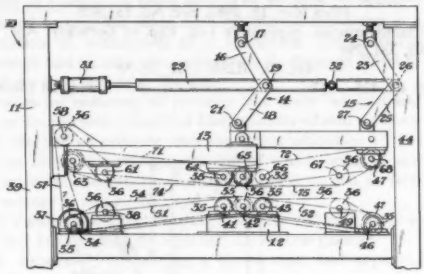
Robert A. Hay, II, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1982, Ser. No. 341,939

Int. Cl.³ B29D *27/00*

U.S. Cl. 425—329 **9 Claims**

1. A plastic foam flexibilization apparatus comprising a first plurality of foam engaging belts, a second plurality of foam engaging belts; the first and second pluralities of foam engaging belts being disposed in generally parallel opposed spaced-apart relationship and adapted to engage a generally planar plastic foam work piece therebetween; a third and fourth plurality of foam engaging belts being disposed in generally parallel opposite spaced-apart relationship and adapted to engage a generally planar plastic foam work piece forwarded between first and second plurality of belts; the first and third plurality of belts being generally coplanar; the second and fourth plurality of belts being generally coplaner; the adjacent portions of the first and third plurality of belts being interdigi-



tated and the adjacent portions of the second and fourth plurality of belts being interdigitated; a drive means to drive said belts wherein the first and second plurality of belts travel at a surface speed greater than the surface speed of the third and fourth plurality of belts.

4,505,663

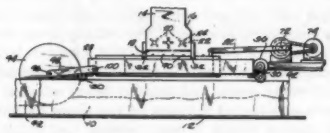
FLAKE FEEDER ALIGNER INCLUDING RECIPROCATING BAFFLES

Tauno B. Kilpela, Atlantic Mine, Mich., assignor to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Jun. 1, 1982, Ser. No. 383,833

Int. Cl.³ B29C *15/00*

U.S. Cl. 425—363 **3 Claims**



1. Apparatus for forming a loosely felted mat of elongated wood flakes, the mat having a longitudinal direction, and the wood flakes being aligned in parallel relation and parallel to the longitudinal direction of the mat, said apparatus comprising:

means defining a support surface for supporting the loosely felted mat of wood flakes,

means for depositing wood flakes on said support surface in a uniformly dispersed, loosely felted relation, said means for depositing being positioned above said support surface,

means for aligning said elongated wood flakes in mutually parallel alignment as said wood flakes are deposited on said support surface, said aligning means being positioned between said support surface and said depositing means, and said aligning means including

a first set of planar baffles,

means for supporting said baffles of said first set in spaced parallel relation and defining vertical planes,

a second set of planar baffles,

means for supporting said baffles of said second set in spaced parallel relation and defining vertical planes and with respective ones of said second set of baffles being positioned between respective ones of said baffles of said first set, and

means for causing reciprocal movement of said baffles of

said second set in a direction parallel to the planes defined by said baffles,

means for maintaining the parallel alignment of the wood flakes deposited on said support surface, said maintaining means including a lower set of space parallel baffles defining vertical planes and positioned beneath said baffles of said first and second sets, said baffles of said lower set having upper edges adjacent the lower edges of and coplanar with said baffles of said first and second sets of baffles, and said baffles of said lower set having lower edges closely adjacent said support surface, and

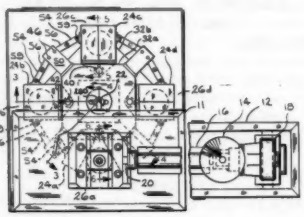
a mat compression roller attached to said means for aligning, said roller including a plurality of spaced parallel discs extending between pairs of adjacent baffles of said lower set of baffles, and each of said discs being adapted to roll along said mat to compress the wood flakes of the mat.

4,505,664

BLOW MOLDING MACHINE

Walter J. Craig, Lockport, Ill., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Dec. 13, 1983, Ser. No. 561,362
Int. Cl.³ B29C *17/07*
U.S. Cl. 425—525 **24 Claims**



1. Multi-station blow molding apparatus comprising a blow mold cavity, a blow pin assembly separate from but cooperatively associable with said cavity, means for advancing said cavity from station to station, means for cooperatively associating said blow pin assembly with said cavity at one of said stations, said apparatus further comprising means: at one of said stations cooperably associable with said blow pin assembly to blow an article to substantially its final shape in said cavity by blowing medium introduced into said cavity via said blow pin assembly; to keep blowing medium in said cavity while it is advanced to a successive station; at said successive station to replace, at said successive station, the blowing medium in said cavity and to introduce new medium into said cavity at said successive station to keep the new medium in said cavity while said cavity is advanced to a further successive station; and finally to remove the article from said cavity.

4,505,665

METHOD AND BURNER TIP FOR SUSPRESSING EMISSIONS OF NITROGEN OXIDES

Mansour N. Mansour, Hacienda Heights, Calif., assignor to Southern California Edison, Rosemead, Calif.

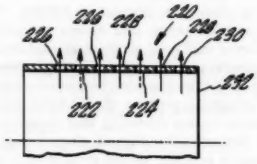
Filed Feb. 19, 1980, Ser. No. 122,690
Int. Cl.³ F23C *5/00*
U.S. Cl. 431—10 **38 Claims**

1. A method for burning a liquid fuel in a combustion zone containing a flame zone while suppressing the production of oxides of nitrogen from burning of the fuel comprising the steps of:

introducing an oxygen containing combustion gas into the combustion zone;

burning the fuel in the combustion zone by ejecting the fuel without gas from a fuel port in a burner tip into the combustion gas, the burner tip having a longitudinal axis, the fuel being ejected from the fuel port into the combustion gas at an angle generally perpendicular to the direction of introduction of the combustion gas and generally perpendicular to the longitudinal axis of the burner tip; and

introducing a control gas into the combustion zone for controlled atomization of the fuel, the control gas bein introduced at an angle generally perpendicular to the direction of introduction of the combustion gas, the control gas



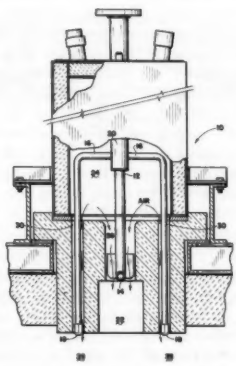
being introduced from at least two gas ports in the burner tip on axially opposite sides of the fuel port, at least one of the gas ports being axially spaced apart from the fuel port at least about 0.3 inch and no more than about 12 inches, wherein the control gas is introduced at a sufficient rate and a sufficient velocity for controlled atomization of the fuel.

4,505,666

STAGED FUEL AND AIR FOR LOW NO_x BURNER

Richard R. Martin, and Kurt S. Jaeger, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Continuation of Ser. No. 306,412, Sep. 28, 1981, abandoned. This application Sep. 28, 1983, Ser. No. 542,098
Int. Cl.³ F23C *5/28*
U.S. Cl. 431—175 **4 Claims**



1. A low NO_x emission fuel-air burner for a furnace chamber comprising:

an air-fuel mixing and injection burner attached to the wall of said furnace such that the downstream face of said burner terminates substantially adjacent an inner wall of said furnace chamber;

means to supply to said burner, at a given instant of burning, a given total amount of fuel under pressure and a given total amount of air, said total amount of air being at least substantially stoichiometrically sufficient to burn said total amount of fuel supplied to said burner;

means to create a primary reaction burning zone that begins in an enclosed space upstream of said inner wall and extends downstream of said inner wall into said furnace chamber and means to supply to said burning zone a first portion of said total fuel and a portion of said total air

which exceeds the stoichiometric requirements for burning said first portion of fuel thereto;

a plurality of conduits in said burner located adjacent said enclosed space, said conduits providing communication between said total air supply and said furnace chamber;

fuel injection nozzle means positioned within each of said conduits such that there is passage of said air thereabout, said nozzle means terminating adjacent said downstream face of said burner;

means to supply the remaining portion of said total fuel to said nozzle means, and means to supply the remaining portion of said total air through said conduits surrounding said nozzle means, said remaining portion of said total air being less than the stoichiometric requirements to burn said remaining portion of said total fuel;

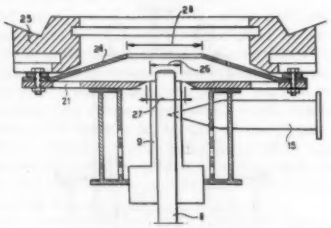
said nozzle means directing said remaining portion of said total fuel as a fan shaped sheet which along with said remaining portion of said total air contributes to the formation of an unconfined secondary reaction burning zone substantially surrounding and reacting with a substantial portion of the unconfined effluent of said primary reaction zone within said furnace chamber, and to cause the inspiration of products of combustion that substantially surround said secondary reaction zone into said secondary reaction zone.

4,505,667

DEVICE WHICH CAN BE USED FOR THE COMBUSTION OF CORROSIVE PRODUCTS AND PROCESS USING THIS DEVICE

Georges Frusta, Digne, and Francois Prudhon, Versailles, both of France, assignors to Atochem, Paris, France

Filed Jun. 28, 1982, Ser. No. 392,682
Claims priority, application France, Jul. 3, 1981, 81 13081
Int. Cl.³ F23M *9/00*
U.S. Cl. 431—182 **3 Claims**



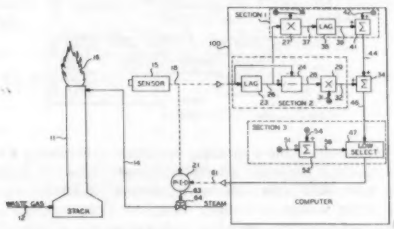
1. Device for the combustion of products or mixtures of products which are corrosive or capable of generating corrosive products, by bringing the said products, in dispersed form, into contact with a combustive fluid at a temperature permitting the incandescence of the cloud of particles formed, the said device comprising a combustion chamber, a head for dispersing the product to be burnt in the said chamber, and a plate connecting the said dispersing head to the combustion chamber, said dispersing head comprising (A) means for the axial introduction of the product to be burnt into said combustion chamber, and means for introducing a first fraction of the combustive product into the combustion chamber in the form of a hollow-vortex flow, means for imparting a sufficient quantity of motion to cause the dispersion of the products to be burnt, by transfer of the quantity of motion, and (B) means for introducing at least one second fraction of the combustive product into the combustion chamber, and means for deflecting the said secondary fraction towards the base of the combustion zone, the dimensions and arrangement of the means B being such as to enable the second combustive fractions to form the complement of the combustive product required for the combustion and to ensure both the stabilization of the incandescent cloud and the cooling of the deflecting means and the connective plate, the head for dispersing the product to be burnt including (a) a chamber for causing the rotation of the first fraction of the combustive product having an outer envelope and an inner envelope defining an annular space therebetween and including perforations in an upstream portion of the inner envelope and tangential inlet means for introducing the combustive product into the annular space, (b) feeding means for introducing the fluid containing the products to be burnt, the dimensions and arrangement of an outlet zone of the chamber (a), and of the feeding means being such as to form a restricted annular passage and (c) the means for deflecting the second fraction toward the base of the combustion zone.

4,505,668

CONTROL OF SMOKE EMISSIONS FROM A FLARE STACK

Robert J. DiBiano; Kim A. Autenrieth, and Gary W. Hales, all of Sweeny, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 15, 1982, Ser. No. 339,802
Int. Cl.³ F23D *13/20*
U.S. Cl. 431—202 **11 Claims**



1. Apparatus comprising:

a flare stack;

means for supplying a combustible waste gas containing hydrocarbons to said flare stack, wherein said waste gas is burned in a combustion zone of said flare stack;

means for supplying steam to the combustion zone in said flare stack;

means for establishing a first signal representative of the amount of infrared radiation from the flare stack flame at a time T;

means for establishing the magnitude of a set point signal in response to the magnitude of said first signal at said time T and for generating said set point signal, wherein said set point signal has a magnitude which is not equal to the magnitude of said first signal if an increase in the flow rate of said steam is required to prevent the emission of smoke from said flare stack or if the flow rate of steam can be decreased without the emission of smoke from said flare stack occurring and wherein said set point signal has a magnitude substantially equal to the magnitude of said first signal if no change in the flow rate of said steam is desired;

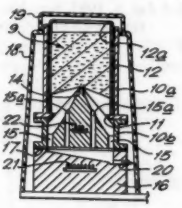
means for comparing said first signal and said set point signal at said time T and for establishing a second signal which is responsive to the difference between said first signal and said set point signal; and

means for manipulating the flow rate of steam to said flare stack in response to said second signal.

4,505,669
LIQUEFYING HOT MELT ADHESIVE

John Rogers, Nuneaton, England, assignor to Dynamelt Limited, Daventry, England

Filed Feb. 14, 1983, Ser. No. 466,082
Claims priority, application United Kingdom, Feb. 15, 1982, 8204305
Int. Cl.[3] F27B *14/00*; E01C *19/45*
U.S. Cl. 432—13 6 Claims

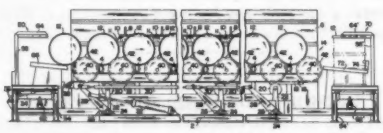


1. A method of liquefying hot melt adhesive, comprising upturning a cylindrical drum filled with a unitary mass of solidified adhesive, lowering the upturned drum into a closely fitting upright cylindrical hopper until it is supported by the mass of adhesive resting on a single, central, upwardly projecting cone in a lower region of the hopper, applying heat through the upright hopper wall and thus through the drum wall to the adhesive to preheat the latter, applying heat to the cone to progressively melt the adhesive, the adhesive and drum falling progressively under gravity alone, and causing the adhesive to flow out of said lower region of the hopper.

4,505,670
APPARATUS FOR MOVING AND THERMALLY CONDITIONING CYLINDRICAL CONTAINERS

Jesus A. Silvestrini, and Juan C. Morsucci, both of Mendoza, Argentina, assignors to Imdec S.R.L., Mendoza, Argentina

Filed Mar. 2, 1984, Ser. No. 585,409
Claims priority, application Argentina, Mar. 2, 1983, 292275
Int. Cl.[3] F27B *9/14*
U.S. Cl. 432—124 28 Claims



1. Apparatus for moving and thermally conditioning generally cylindrical containers, comprising

mounting means;

container support means fixedly connected to said mounting means for selectively engaging each such container at predetermined positions with the cylindrical axis of such container in a generally horizontal position;

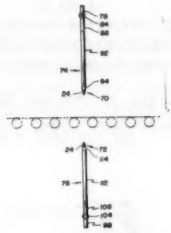
container moving means carried by said mounting means and being selectively movable relative to said container support means between a first vertical position carrying such a container out of engagement with said supporting means and a second vertical position permitting engagement between such container and said supporting means, said container moving means comprising at least two adjacent members, the mutually closest portions of which are spaced apart a horizontal distance less than the diameter of such a container to be moved thereby and positioned below the axis of such container and being movable relative to the cylindrical sidewalls of such a container in directions generally tangential to the container sidewalls at the points of contact therewith, whereby the relative motion between the container and the members, when in carrying engagement therewith, will effect a rotational movement of the container about its axis; and

means for effecting predetermined heat flow relative to such a container to change the temperature of the container by a predetermined amount.

4,505,671
GLASS SHEET ROLLER CONVEYOR FURNACE INCLUDING GAS JET PUMP HEATING

Harold A. McMaster, Woodville, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio

Continuation-in-part of Ser. No. 235,269, Feb. 17, 1981, abandoned. This application Dec. 22, 1981, Ser. No. 332,504
Int. Cl.[3] F27B *9/00, 9/06*; C03B *13/00*; F27D *11/00*
U.S. Cl. 432—144 14 Claims



1. A glass sheet heating furnace comprising: a housing defining a heating chamber; a roller conveyor including horizontally extending rolls for conveying glass sheets horizontally through the heating chamber for heating thereof; at least one gas jet pump located within the heating chamber and having an external surface including a distal end; a source of pressurized gas communicated with the gas jet pump; said gas jet pump having means for supplying the pressurized gas from the source directly to the external surface for flow toward the distal end thereof to supply a primary gas flow thereto in order to induce a secondary gas flow and provide a combined flow of heated gas; and said gas jet pump being oriented such that the combined flow of heated gas therefrom is directed from the external surface thereof toward the conveyor to provide forced convection heating of conveyed glass sheets during conveyance thereof on the rolls of the conveyor with the bottom glass sheet surfaces in continuous engagement with the conveyor rolls.

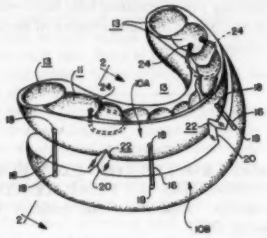
4,505,672
TWO-PIECE GNATHOLOGIC ORTHODONTIC POSITIONER

Craven H. Kurz, 465 N. Roxbury Dr. #1011, Beverly Hills, Calif. 90210

Filed Nov. 14, 1983, Ser. No. 551,410
Int. Cl.[3] A61C *7/00*
U.S. Cl. 433—6 5 Claims

1. A pre-formed orthodontic tooth positioning and retaining appliance comprising: a molded two-piece arch-shaped body of resilient material having an upper section and a lower section, said upper section having an archway formed on its top surface with a plurality of tooth sockets therein for receiving the teeth of the maxillary arch of a patient, said lower section having an archway formed in its bottom surface with a plural-

ity of tooth sockets therein for receiving the teeth of the mandibular arch of the patient; and resilient means connected to



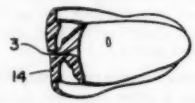
the upper and lower sections for biasing the sections together in a traction relationship.

4,505,673

ORTHODONTIC TREATING DEVICE AND METHOD OF MANUFACTURING SAME

Osamu Yoshii, Chofu, Japan, assignor to Hito Suyehiro, Rockville, Md.

Filed Oct. 26, 1977, Ser. No. 845,619
Claims priority, application Japan, Nov. 5, 1976, 51-132323
Int. Cl.[3] A61C *7/00*
U.S. Cl. 433—6 **6 Claims**



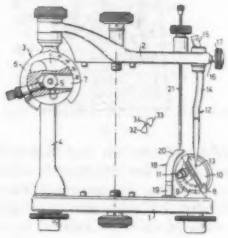
1. A method of manufacturing a silicone resin orthodontic treating device which comprises
(a) preparing plaster models of a patient's upper and lower jaw including the teeth showing malocclusion,
(b) determining the centric relationship between the patient's upper and lower teeth by taking a wax impression,
(c) taking a face-bow transfer of the patient's upper teeth to establish and reproduce the relationship of upper jaw to the head and face,
(d) placing the face-bow in an anatomical articulator,
(e) positioning the upper and lower models of step (a) in the anatomical articulator using the face-bow and wax bite of step (b) to reproduce the patient's upper and lower jaw relationship and fixing the models in plaster such that the models are attached to the articulator,
(f) removing the teeth from the models and re-aligning the teeth in wax to normal occlusion,
(g) duplicating the normal occlusion of the models with a duplicating material to form negative impressions,
(h) forming positive plaster models from the negative impressions,
(i) opening the articulator to form a space of from 3 to 5 mm between the upper and lower incisor edge,
(j) placing wax in the space to obtain an impression of the upper and lower teeth in normal occlusion,
(k) placing the teeth of the upper and lower plaster models of step (h) into the wax impression of step (j),
(l) covering the resulting combination of step (k) with wax such that the wax will have substantially the same shape and thickness as the silicone resin treating device,
(m) flasking the wax covered model combination of step (1) in a split-cast,
(n) subjecting the split-cast containing the wax covered model to heat sufficient to melt the wax and produce a void,
(o) removing the wax,
(p) filling the void with a hot-curable silicone resin and curing the resin, and
(q) removing the silicone resin treating device.

4,505,674

ARTICULATOR FOR USE IN MAKING DENTURES OR PARTS THEREOF

Svante R. Edwardson, Solna, Sweden, assignor to AB Dentatus, Hagersten, Sweden

Filed Jul. 5, 1983, Ser. No. 510,899
Int. Cl.[3] A61C *11/00*
U.S. Cl. 433—59 **8 Claims**



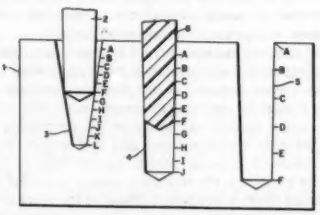
1. An articulator, for use in making dentures or parts thereof, comprising a lower and an upper principal member which are interconnected by means of a condylar mechanism that allows relative movements between said principal members, a turntable incisal table having a rotational center and being attached to said lower principal member on a virtual center line dividing said principal member into two mirror-invertedly similar parts, an incisal pin lockably and vertically adjustably mounted in said upper principal member above said incisal table and having a tip pointing towards the table, a freedom-in-centric guide table having an upper surface located with its center in a vertical plane through said virtual center line and located outside said rotational center of said incisal table, and an extra pin lockably and vertically adjustably mounted in a separate locking device in said upper principal member above said freedom-in-centric guide table and having a tip pointing towards said guide table.

4,505,675

METHOD AND DEVICE FOR PREPARING ENDODONTIC FILLER

David C. Albert, 1800 Newell St., Alice, Tex. 78332

Filed Nov. 22, 1982, Ser. No. 443,570
Int. Cl.[3] A61C *19/04*
U.S. Cl. 433—72 **2 Claims**



1. A gauge for forming an endodontic filler for a root canal external to said root canal which comprises a unitary member having a plurality of calibrated, elongated, tapered cavities, the

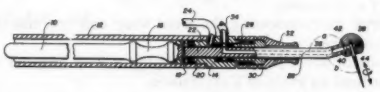
first said cavity being adapted to receive an elongated instrument having a terminal diameter corresponding to the minimum diameter of said root canal and precisely fitting therein, said instrument when inserted into said cavity being positioned to engage the side thereof to register the point on the wall of said cavity corresponding to the minimum diameter of said root canal, the second calibrated cavity having an appropriate form to receive said instrument or a filler material, and having a linear scale corresponding to the calibration on said first cavity and adapted to indicate the point on said second cavity corresponding to said minimum diameter of the root canal.

4,505,676

ENDODONTIC UNIT

Donald I. Gonser, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Sep. 30, 1983, Ser. No. 537,906
Int. Cl.³ A61C *1/07*
U.S. Cl. 433—119 **3 Claims**



1. An endodontic unit to support and vibrate an endodontic file comprising in combination, an ultrasonic oscillating body member adapted to be energized to oscillate in ultrasonic ranges and having an operating end, a tubular conduit stem connected at one end with said operating end of said body member for vibration thereby and having a portion projecting longitudinally beyond said operating end of said member, a weighted head of predetermined amount connected to the outer end of said stem and having a socket opening outwardly from said head and communicating with said stem, means connected respectively to said stem and to a source of liquid medicament to supply the same to said socket for discharge therefrom, said stem having a first obtuse angle therein of approximately 165° intermediate of the ends of the portion thereof extending beyond said body member, thereby to dispose the axis of said socket at a second obtuse angle of approximately 105° to the longitudinal axis of said body member, said socket having a larger diameter than the shank of a file adapted to be mounted in said socket, whereby a space is provided in said socket which communicates with the opening in said stem to receive liquid medicament therefrom and discharge it longitudinally along a file when the same is affixed within said socket, and means on said head to secure a file within said socket.

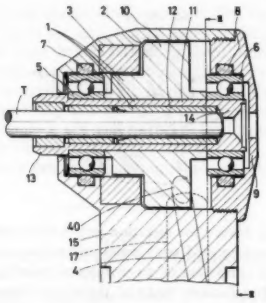
4,505,677

DRIVING METHOD AND DEVICE FOR DENTAL HAND-PIECE

Shozo Nakayama, and Hiroo Watanabe, both of Kyoto, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed May 25, 1983, Ser. No. 498,088
Claims priority, application Japan, Jun. 21, 1982, 57-107081
Int. Cl.³ A61C *1/05*
U.S. Cl. 433—132 **2 Claims**

1. A device for driving a dental handpiece wherein turbine blades of a turbine rotor having a cutting tool shaft substantially vertically with respect to the grip portion of the handpiece having therein an air feed channel and an air exhaust channel communicating with a blade chamber are freely rotatable in a blade chamber and through said air feed channel compressed high-velocity fluid is jetted at each end of said blades to rotate the blades in their direction of rotation, said device being characterized in that an adapter comprising a round ring member, a fluid inlet provided through a periphery of said ring member, and a partial peripheral groove formed in said periphery communicating with said inlet at the one end of said groove and with a fluid outlet provided through said periphery at the other end of said groove, is adapted in such a manner that the adapter is fixedly disposed in said blade chamber axially adjacent on one side alone to an annular space in which said blades rotate with said fluid inlet located on the axially opposite side of an opening of said air feed channel so



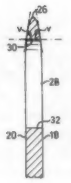
that said fluid outlet communicates with the side of said blade in said annular space ahead of the direction of rotation, and an exhaust communication channel which opens into said exhaust channel and extends peripherally is formed on the other side of said turbine blades not adjacent to said adapter.

4,505,678

TARTAR REMOVAL INSTRUMENT

Bror A. E. Andersson, Österängsvägen 24, S-182 76 Enebyberg, Sweden

Filed Nov. 21, 1983, Ser. No. 554,117
Claims priority, application Sweden, Nov. 19, 1982, 8206610
Int. Cl.³ A61C *17/00*
U.S. Cl. 433—143 **4 Claims**



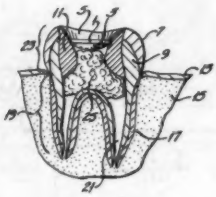
1. An instrument for removing tartar, including a handle having at least at one end a steel working portion formed with a sharp edge for scraping a tooth clean, characterized in that the working portion consists of an arm the free end portion of which has dimensions such that it can be moved into the space between a pair of juxtaposed teeth or along a tooth and down below the gum line; in that the end portion has rounded-off edges to obviate damage to the gum; and in that said end portion is made with at least one through-opening which at least at one end of the opening has an edge which at least along a part of the periphery thereof is formed into a scraping edge with a predetermined cutting angle, the end portion of the arm forming a blade both sides of which are convex so that the cutting angle at the edges of the opening will be less than 90°, at least along the greater portion of the periphery of the respective edge.

4,505,679

ENDODONTIC SEALING APPARATUS AND METHOD

Herbert N. Gutentag, 200 Maple Ave., Red Bank, N.J. 07701

Filed Jun. 27, 1983, Ser. No. 507,972
Int. Cl.[3] A61C 5/02
U.S. Cl. 433—224 4 Claims



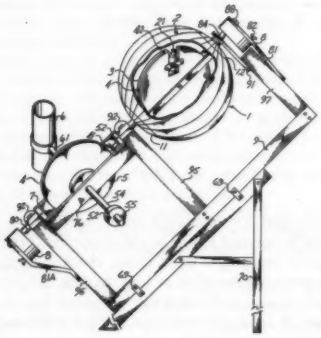
1. A sealing device for insertion into a root canal tooth for temporarily sealing said root canal comprising an hourglass-shaped device consisting of an orifice comprising a rim from which extends a flexible material therefrom forming a slight concavity; and wherein a substantially rigid hollow, hourglass-shaped member extends from said rim providing an enclosure within which said flexible material extends, said hourglass-shaped member tapering to a narrower orifice relative to the initial opening, and wherein said narrower orifice then widens to form a second opening which fits over the entrance to the root canal.

4,505,680

SPHERICAL STAR CHART WITH INDICATOR

Thomas E. Nightengale, 215 "I" St., Laporte, Ind. 46350

Filed Mar. 31, 1983, Ser. No. 480,875
Int. Cl.[3] G09B 27/06
U.S. Cl. 434—289 5 Claims



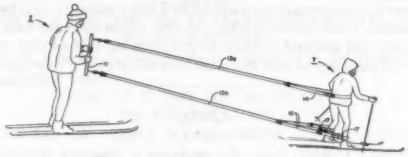
1. Apparatus for charting the movement of celestial bodies comprising a frame, means for sighting said celestial bodies shiftably carried by said frame, a translucent glode rotatably secured about an axis of said frame at one end, said globe pivotally secured to said sight means at its other end, light means positioned within said globe for focusing a spot of light on the globe corresponding to the position said sight means, and means for rotating said globe wherein said spot of light allows charting of the movement of said celestial bodies.

4,505,681

SKI TRAINING AID

Kent R. Jones, 4729 Bonner Way, Salt Lake City, Utah 84117

Filed Oct. 14, 1983, Ser. No. 542,063
Int. Cl.[3] A63C 11/00
U.S. Cl. 434—253 4 Claims



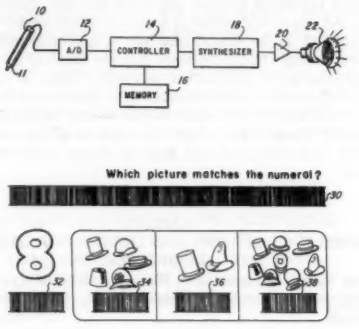
1. A ski training aid comprising
an elongate handlebar adapted to be grasped and held by a ski instructor;
a waist strap forming a loop adapted to fit around the waist of a ski trainee;
a strap interconnecting the waist strap and one end of the handlebar;
a pair of ankle straps, each forming a loop adapted to fit around an ankle of a ski-trainee;
strap means interconnecting the ankle straps and;
a strap having one end connected to the other end of the handlebar and its other end slidably connected to the strap means interconnecting the ankle straps.

4,505,682

LEARNING AID WITH MATCH AND COMPARE MODE OF OPERATION

Barbara J. Thompson, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 25, 1982, Ser. No. 382,006
Int. Cl.[3] G09B 5/06
U.S. Cl. 434—335 10 Claims



1. An interactive learning apparatus comprising:
(a) scanning means for reading student selected coded indicia from a medium, said coded indicia including a first coded indicia associated with a first displayed object and a plurality of second coded indicia, each second coded indicia associated with a second displayed object one of said second displayed objects having a desired relationship to the corresponding first displayed object;
(b) initialization means connected to said scanning means responsive to reading first coded indicia for entering a match mode, selecting prompting output data and identifying said second coded indicia associated with said second displayed object having the desired relationship to said first displayed object;
(c) comparison means connected to said scanning means

responsive to reading a selected second coded indicia for selecting first comparison output data if said second coded indicia is said identified second coded indicia and for selecting second comparison output data if said selected second coded indicia is not said identified second coded indicia; and

(d) output means connected to said initialization means and said comparison means for generating a student perceivable output corresponding to said selected output data.

4,505,683

DEVICE FOR RAPID DEMONSTRATION OF THE ACTION OF PHOTOTROPIC OBJECTS

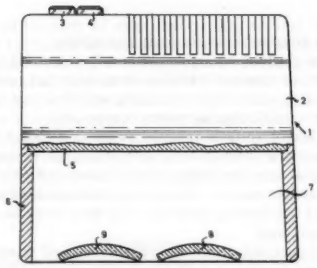
Hermann Schürle, Aalen; Wolfgang Grimm, Heidenheim, and Hubert Bammert, Aalen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,893

Claims priority, application European Pat. Off., May 13, 1982, 82104181.1

Int. Cl.³ G09B *25/00*

U.S. Cl. 434—365 **6 Claims**



1. A device for rapidly demonstrating the action of phototropic objects such as eyeglasses, comprising a housing adapted to be placed on a support and provided with a recess (7) to receive an object being demonstrated (**8**, **9**) while said object lies on said support, at least one electron flash tube and an associated reflector for directing a flash from said tube toward said object, said flash tube emitting UV-A radiation to impinge on said object, and circuit means which upon each actuation automatically produces a plurality of flashes which succeed each other at a predetermined time interval.

4,505,684

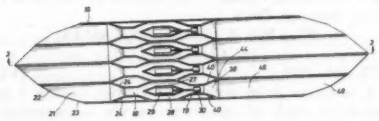
THRUST TUBE PROPULSION SYSTEM

Joseph T. Holden, and Finn Christensen, both of 1300 Augusta Ste. 25, Houston, Tex. 77057

Filed Dec. 2, 1982, Ser. No. 446,180

Int. Cl.³ B63H *11/02*

U.S. Cl. 440—38 **5 Claims**



1. A vessel comprising:

(a) a deck;

(b) a hull;

(c) bulkhead means separating said hull and said deck providing structural strength for said vessel;

(d) at least two parallel thrust tubes incorporated in said hull of said vessel, said thrust tubes defining fluid passages extending longitudinally along said hull, each of said thrust tubes having substantially identical inlet and outlet openings and sharing a common wall therebetween defining a portion of said thrust tubes;

(e) a venturi housing forming a portion of each of said thrust tubes, said venturi housing including an entrance and an exit;

(f) wherein said thrust tubes include a first transition zone terminating at the entrance of said venturi housing, said transition zone being defined by wall members of said thrust tubes, said wall members including vertically disposed converging side walls having upwardly inclined top edges supporting an upwardly directed top wall, said side walls extending upwardly from a horizontally disposed bottom wall; and

(g) propulsion means for moving said vessel through a fluid medium.

4,505,685

METHOD OF MANUFACTURING DISPLAY STRUCTURES

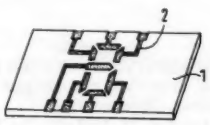
Kurt M. Tischer, Wendlingen; Klaus-Peter Voigt, Esslingen, and Rolf Zondler, Stuttgart, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 20, 1982, Ser. No. 340,928

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3101872

Int. Cl.³ H01J *9/02*

U.S. Cl. 445—24 **9 Claims**



1. A method for manufacturing a conductive display structure of an electronic display using a printing process comprising the steps of:

providing a substrate as a base for a conductive display structure:

coating said substrate with an electrically conductive layer on a surface thereof;

printing a pattern of etch resistant, strippable material on said electrically conductive layer, said pattern having a shape congruent with said conductive display structure, said printing step including the steps of providing a print carrier in the form of a plate with concave impressions therein corresponding to said shape of said pattern, said pattern including an arrangement of electronic circuitry and applying said strippable material into said concave impressions by means of a tampon-type printing pad prior to the printing of said pattern onto said electrically conductive layer, said print carrier plate with said concave impressions contacting said electrically conductive layer of said substrate:

etching away said electrically conductive layer except where said printed pattern has been deposited; and

stripping away said etch resistant, strippable material from said substrate thereby leaving said conductive display structure as the unetched residue of said etching step.

4,505,686

CONVERTIBLE TOY

James F. Mariol, 481 Deanview Dr., Cincinnati, Ohio 45224

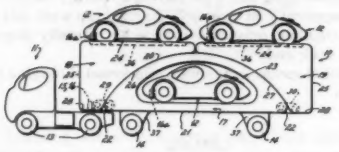
Filed Jan. 19, 1983, Ser. No. 459,210

Int. Cl.³ A63H *17/00, 17/05*

U.S. Cl. 446—95 **13 Claims**

1. A toy transport vehicle comprising a trailer having a main body portion with a substantially semi-circular upper exterior

surface and a substantially flat bottom surface, the two surfaces meeting at either end of the main body portion, and two end portions, the end portions being pivotally connected adjacent respective ends of the main body portion, the end portions each having a surface with a concave contour matching a portion of the upper surface of the main body portion such that the end portions can be pivotally placed in facial engagement therewith and in a transport configuration to defind a substan-



tially rectangular solid for the trailer, the end portions when pivoted outwardly from the main body portion and into a bridge configuration converting the transport trailer into a bridge having a substantially smoothly curving upwardly facing surface over which a toy automobile can move and under which a toy automobile can pass through a passage formed by the main body portion being supported and suspended between the end portions.

4,505,687

FORM RETAINING STUFFED FIGURINE

Joan C. Munro, River Vale, N.J., assignor to American Greetings Corporation, Cleveland, Ohio

Filed Aug. 15, 1983, Ser. No. 523,289
Int. Cl.³ A63H *3/00, 33/00*
U.S. Cl. 446—368 **10 Claims**

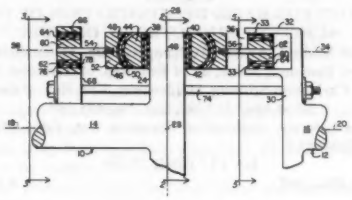
8. A form retaining figurine comprising a head portion and a body portion; said body portion comprising (i) an outer covering of compliant, fabirc material, said outer covering having a coiled shape comprising a plurality of coils having an inner periphery and an outer periphery, said outer covering having a seam extending along the coils of the tubular outer covering, (ii) a soft, compliant fill material disposed within said outer covering, and (iii) a length of elastic fixedly secured to and being confined to the inner periphery of said outer covering and extending along the seam thereof; said length of elastic being held by the outer covering in a partially tensioned state in which it resiliently biases said plurality of coils to a condition in which they have a common inside diameter; said coils beng deformable against said resilient bias, whereby the figurine is returned to a coiled configuration when the deformation forces are removed.

4,505,688

CONSTANT VELOCITY COUPLING HAVING LAMINATED ELASTOMERIC BEARINGS

Robert R. Peterson, Hudson, Mass., assignor to Barry Wright Corporation, Newton Lower Falls, Mass.

Filed Feb. 12, 1981, Ser. No. 233,711
The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.
Int. Cl.³ F16D *3/16*
U.S. Cl. 464—111 **9 Claims**



1. A constant velocity joint comprising
a first member rotatable about a first rotation axis;
a second member rotatable about a second rotation axis;
coupling means for connecting said first and second members, said coupling means comprising
(1) three trunnions rotatable with said first member about said first rotation axis, said trunnions having respective radial axes extending radially from and perpendicular to said first rotation axis equiangularly around said first axis and intersecting said first axis at a common intersecting point, and
(2) connecting means for connecting said trunnions to said second member, said connecting means comprising laminated elastomeric bearing means for carrying in compression torque transmitted between said first and second members and carrying in shear axial misalignment of said first and second members and relative angular motion between said first and second members, and
(3) wherein said laminated elastomeric bearing means includes a plurality of cylindrical laminated elastomeric bearing units each coupled between said first and second members and to one of the trunnions coaxially with the radial axis of the respective trunnion and radially spaced from said common intersecting point, whereby said cylindrical laminated elastomeric bearing units carry torque transmitted between said first and second members in compression and motion resulting from angular, misalignment in shear.

4,505,689

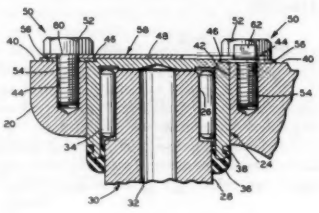
MOUNTING FOR A BEARING CUP OF A UNIVERSAL JOINT

Philip J. Mazziotti, Toledo, Ohio, assignor to The Zeller Corporation, Defiance, Ohio

Filed Feb. 3, 1983, Ser. No. 463,651
Int. Cl.³ F16D *3/26*
U.S. Cl. 464—130 **13 Claims**

1. A universal joint comprising a yoke having a pair of spaced arms, each of said arms having a transverse bore aligned with the transverse bore of the other arm, said arms also having outer planar locating surfaces around the bores, located in a common plane, and terminating at the bores, with said locating surfaces on said spaced arms being spaced apart predetermined distances, said arms having threaded holes in the locating surfaces spaced uniformly around the bores, a flangeless bearing cup in each of said bores, said cup having a side wall of predetermined thickness, an open end, and a closed end with a substantially flat outer surface, the closed end of each of said bearing cups having recessed, outer locating sur-

faces spaced uniformly around a peripheral edge of the closed end of the cup and located in a common plane which is substantially parallel with the flat outer surface of said closed end of said cup, each of said recessed cup surfaces having a periphery in the shape of part of the circumference of a circle, extending less than 180°, and terminating at the peripheral edge of the cup, said threaded holes in the arm locating surfaces being spaced from and concentric with the periphery of the corresponding cup locating surfaces, said arm and cup locating surfaces being always positioned in a common plane for any



circumferential position of said cup relative to said arm, a fastener with a threaded shank engaged in each of the threaded holes, and means forming an annular, planar locating surface around the threaded shank of each of said fasteners and engaging corresponding locating surfaces of the corresponding arm and cup to position the cup in a predetermined location relative to the yoke arm and to the opposite cup, and to prevent rotation of the cup in the arm, the radius of the outer edge of the annular surface substantially equalling the radius of the corresponding recessed cup surface.

4,505,690

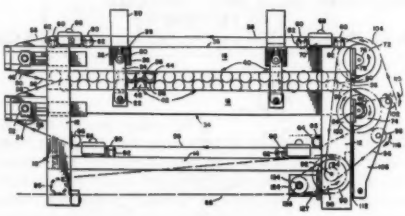
TRANSMISSION DRIVE WITH CYCLIC SPEED VARIATIONS AND USES THEREOF IN COMPACTION SYSTEMS USING DUAL WIRE-MESH BELTS

Jerry R. Fram, 10627 Rochester Ave., Los Angeles, Calif. 90024

Continuation of Ser. No. 171,352, Jul. 23, 1980, , which is a division of Ser. No. 065,189, Aug. 9, 1979, abandoned. This application May 19, 1983, Ser. No. 495,978

Int. Cl.³ F16H *11/00*

U.S. Cl. 474—69 **9 Claims**



1. In a transmission drive in which a first, driven member which is rotatable about a first, relatively stationary axis and is driven by means of an endless, flexible transmission medium by a second, driving member which is rotatable about a second, relatively stationary axis parallel to said first axis, and is driven by drive means at a constant speed of rotation, said transmission medium having a first leg on the entrant side of said driven member and a second leg on the exit side of said driven member,

an arrangement for super-imposing on the constant speed of rotation drive of said driven member, a periodic motion changing the speed of rotation of said driven member, said arrangement comprising:

a pair of rotatable idler elements each mounted on an axle, one of said idler elements being engaged by said first leg of said endless transmission medium and the other of said idler elements being engaged by said second leg of said endless transmission medium,

linkage means carrying said axles at a fixed mutual spacing and mounted for movement in two opposite directions perpendicular to said axles to permit corresponding displacement of the idler elements engaging the two legs, respectively, of said transmission medium, and

means coupled to said linkage means and periodically reciprocating in a cyclic motion having two half cycles,

so as to cause said idler elements to shorten one of said legs while simultaneously lengthening the other leg, and vice versa in alternate half cycles, whereby the speed of rotation of said driven member is periodically varied.

4,505,691

UNIVERSAL TIGHTENER FOR A TRANSMISSION CHAIN OR BELT

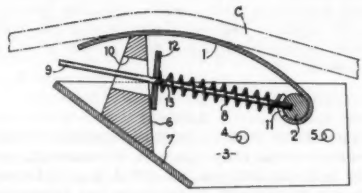
Bernard Kohler, La Celle St-Cloud, France, assignor to Sedis Compagnie des Transmissions Mecaniques, France

Continuation of Ser. No. 224,065, Jan. 12, 1981, abandoned. This application Nov. 21, 1983, Ser. No. 553,870

Claims priority, application France, Jan. 18, 1980, 80 01042

Int. Cl.³ F16H *7/08*

U.S. Cl. 474—101 **6 Claims**



1. A universal mechanical tightener for a transmission chain or belt for a timing-gear of an internal combustion engine, said universal mechanical tightener comprising:

a support member comprising a mounting plate portion having a planar portion and raised tab portion, said planar portion being adapted to be mounted to said internal combustion engine in proximity to said transmission chain or belt, said support member further comprising a pivot portion extending from said planar portion of said mounting plate portion and an inclined ramp portion extending from said raised tab portion of said mounting plate portion, said inclined ramp portion being spaced from said pivot portion and having an inclined ramp surface inclined away from said pivot portion and facing towards said transmission chain or belt;

a contoured strip having a bearing side and a biasing side, said bearing side adapted to move towards and bear against said transmission chain or belt, said contoured strip further having a pivot end mounted at said pivot portion of said support member;

a wedge member having a ramp engaging surface for slidably engaging said inclined ramp surface of said support member and a strip engaging surface for engaging said biasing side of said contoured strip, said wedge member further having an anti-return surface facing said pivot portion of said support member and a rod clearance therethrough intermediate said strip engaging surface and said ramp engaging surface;

an anti-return plate having a wedge facing surface facing said anti-return surface of said wedge member, a pivot portion facing surface facing said pivot portion of said support member, and a rod aperture having an inner diameter communicating said pivot portion facing surface and said wedge facing surface;

a rod having a first rod end mounted at said pivot portion and a rod length, said rod length slidably supported by said inner diameter of said rod aperture of said anti-return plate and clearing said wedge member at said rod clearance thereof, said rod having an outer diameter providing a jammable clearance with said inner diameter of said rod aperture of said anti-return plate so as to enable said rod to effect an acute jamming angle with respect to said anti-return plate preventing said anti-return plate from moving towards said pivot portion; and

wedge-biasing and anti-return-arming spring means confiningly guided by said rod compressed between said pivot portion of said support member and said pivot portion facing surface of said anti-return plate, said wedge-biasing and anti-return-arming spring means operative to urge said anti-return plate to slide said wedge member on said inclined ramp surface away from said pivot portion and towards said transmission chain or belt while simultaneously arming said anti-return plate by effecting said acute jamming angle with said rod;

whereby, as said wedge-biasing and anti-return-arming spring means urge said anti-return plate to slide said wedge member on said ramp surface away from said pivot portion towards said transmission chain or belt, said strip engaging surface of said wedge member urges said contoured strip towards said transmission chain or belt to pivot both said contoured strip and said rod at said pivot portion of said support member, said wedge-biasing and anti-return-arming spring means at the same time causing said anti-return plate to effect said acute jamming angle with respect to said rod to prevent said anti-return plate from moving towards said pivot portion of said support member.

4,505,692
TRACTION DEVICE FOR BUFFERING TUBES

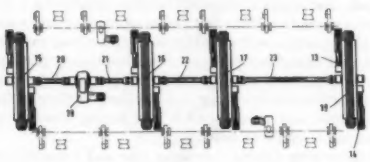
Jürgen Boos; Achim Homersen, both of Düsseldorf, and Klaus-Peter Schirmag, Ratingen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düesseldorf, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,500

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3206576

Int. Cl.³ F16H *7/08*

U.S. Cl. 474—111 **2 Claims**



1. A reversible traction device for transferring elongated stock and including one or more endless chains with transport and traction rollers and including further support means for the upper stringer of each of the endless chains, the improvement comprising:

a reversibly driven sprocket like drive wheel engaging the upper stringer of one of the chains; and

two guide members respectively disposed to one side and the other of the sprocket wheel, each member being pivotably adjustable about a horizontal axis to change its orientation for orienting the chain in different directions vis-à-vis the sprocket wheel such that the particular guide member running the chain towards the sprocket wheel is oriented to direct the chain towards the apex of the sprocket wheel with an upward inclination accordingly, while the respective other one of the guide members is slightly downwardly oriented for catching the chain as it runs off said sprocket wheel, said guide members reversing orientations upon reversal of the sprocket wheel.

4,505,693
POWER TRANSMISSION CHAIN

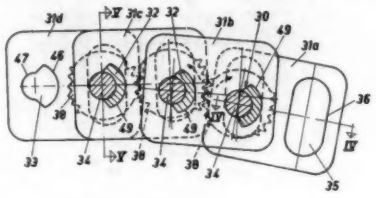
Hans B. F. Moss, Gothenburg, Sweden, assignor to AB Volvo, Torslanda, Gothenburg, Sweden

Filed Feb. 8, 1983, Ser. No. 464,990

Claims priority, application Sweden, Feb. 12, 1982, 8200839

Int. Cl.³ F16G *1/24*

U.S. Cl. 474—240 **15 Claims**



1. A power transmission chain comprising at least a series of overlapping links held together by joints in front and back connections as seen in the direction of motion in the form of thrust shafts, between which are placed cooperating transmission pieces, which upon rotation transmit a corresponding rotation to the next thrust shaft as seen in the direction of the chain motion, wherein each thrust shaft is non-rotatably fastened to at least one transmission apparatus comprising a force and motion communicating transmission part arranged to cooperate with the transmission part attached to the next thrust shaft.

4,505,694
APPARATUS FOR FABRICATING A BAG-IN-BOX PACKAGE

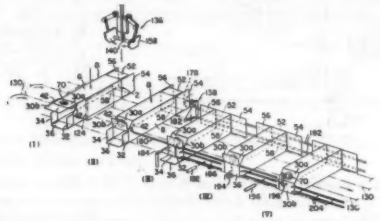
Masataka Okushita, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 236,547, Feb. 20, 1981, Pat. No. 4,386,923. This application Sep. 24, 1982, Ser. No. 423,439

Claims priority, application Japan, Feb. 22, 1980, 55-21176; Feb. 22, 1980, 55-22041[U]; Apr. 24, 1980, 55-56090[U]; May 22, 1980, 55-68186; Jul. 22, 1980, 55-104127[U]

Int. Cl.³ B31B *7/26*

U.S. Cl. 493—101 **8 Claims**



1. An apparatus for fabricating bag-in-box packages, comprising:

(a) means for feeding a succession of semifinished bag-in-box packages, each initially in a collapsed state, along a predetermined path with each package oriented transversely thereon, each semifinished bag-in-box package comprising

(1) a box having a set of four panels foldably connected together to form a rectangular tube, a set of four top flaps foldably connected to the respective panels for conjointly

closing one end of the rectangular tube, a set of four bottom flaps also foldably connected to the respective panels for conjointly closing the other end of the rectangular tube, and a bevel flap foldably connected between one of said four panels and the corresponding one of the top flaps,

(2) a bag disposed within the box and formed by two substantially rectangular, superposed layers of flexible material hermetically sealed together, said bag having a fitment attached to one of the superposed layers and projecting outwardly of the box through said bevel flap,

(3) adhesive means securing one of the layers of the bag at least to one of the inside surfaces of the box;

(b) means on the predetermined path for erecting each semifinished, collapsed bag-in-box package, the bag within the erected box being bent into the shape of a U;

(c) means on the predetermined path for inflating the bag of each erected package into close internal contact with the box, said inflating means comprising a blow head for introducing a gas under pressure into the bag through the fitment, the blow head being movable into and out of engagement with the fitment;

(d) means on one side of the predetermined path for closing said one end of the rectangular tube, formed by the panels of the box of each erected package, with the set of top flaps; and

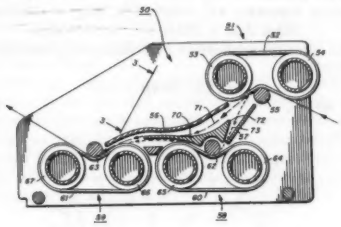
(e) means on the other side of the predetermined path for closing said other end of the rectangular tube, formed by the panels of the box of each erected package, with the set of bottom flaps.

4,505,695

SHEET DECURLING MECHANISM

Philip A. Billings, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1983, Ser. No. 485,984
Int. Cl.³ D21F 7/00
U.S. Cl. 493—459 **1 Claim**



1. A sheet decurler comprising:

a sheet transport belt supported by at least two rollers for supporting the belt therearound and arranged to receive curled copy sheets from the fusing apparatus of a copier;

a penetrating roller disposed adjacent the belt run between said belt rollers adapted for contact with the outer surface of said transport belt to depress the same to form a nip therebetween, the degree of penetration of said penetrating roller relative to the belt being of an amount of reverse curl induced in a copy sheet fed between said penetrating roller and said belt as the sheet passes therebetween; and

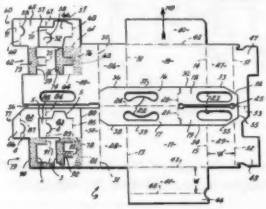
a gate positioned downstream of said penetrating roller/belt nip arranged to deflect a sheet of paper into one or another of two paths in accordance with the degree of curl imposed thereon by said roller/belt nip, said one path having a curling device therein arranged to decurl the sheets having slight curl thereon, said other path having a curling device therein arranged to decurl the sheets having a high degree of curl and to combine with the curling device in said one path to complete the decurling of the sheets entering said other path.

4,505,696

METHOD OF ERECTING A COMPLIANCE CARRIER

William H. Wright, Cincinnati, Ohio, and John M. Kruse, Newport, Ky., assignors to The C.W. Zumbiel Co., Cincinnati, Ohio

Division of Ser. No. 134,959, Mar. 28, 1980, Pat. No. 4,319,682.
This application Jul. 10, 1981, Ser. No. 282,035
Int. Cl.³ B31B 7/26
U.S. Cl. 493—130 **9 Claims**



1. A method of erecting a carrier blank into a basket type compliance carrier, said method comprising the steps of

providing a carrier blank having side wall panels, end wall panels, and a floor panel,

two cell divider panel sections, each of said divider sections comprising at least two cell divider panels, the cell divider panels of each divider section cooperating with one side wall panel to provide a row of cells when said carrier is assembled and erected, thereby providing two side-by-side cell rows, and

two cell compliance panel sections, each of said compliance sections comprising at least two cell compliance panels, the cell compliance panels of each compliance section cooperating with one cell divider panel section to provide a double thickness in the heel and shoulder areas of the cell divider panels of adjacent cells, and

passing said blank through a gluing machine in a machine direction for assembly into a knock-down carrier structure from said carrier blank structure, said cell divider panels and cell compliance panels within each associated pair of cell divider and cell compliance panel sections being glued one to the other in double thickness form upon folding one section in a cross machine direction relative to the other section without folding back of any glue tabs or panels within any of said sections.

4,505,697

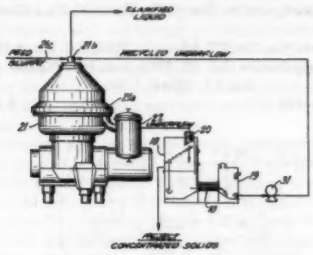
UNDERFLOW CONCENTRATION CONTROL FOR NOZZLE CENTRIFUGES

Chie-Ying Lee, Pleasant Valley; James D. West, and Gerald F. Cole, both of Poughkeepsie, all of N.Y., assignors to Alfa-Laval, Inc., Poughkeepsie, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,080
Int. Cl.³ B04B 7/00
U.S. Cl. 494—35 **21 Claims**

1. In the operation of a centrifugal separator having an inlet for a liquid and solids mixture and a first outlet for clarified liquid, the separator also having a second outlet for an underflow of solids concentrated in residual liquid, the method of controlling the concentration of solids in the underflow, said method comprising the steps of discharging underflow from said second outlet into a return line while operating the separator, continuously flowing underflow through said line while dividing the underflow into a plurality of divisions, passing said divisions through respective passages each having a cross-sectional flow area and a shear area, the ratio of said shear area

to said flow area being sufficiently high to substantially reduce the flow rate through said passages in response to an increase



in the viscosity of the underflow, and returning the underflow from said passages to said inlet of the separator.

4,505,698

SELF-EMPTYING CENTRIFUGE DRUM

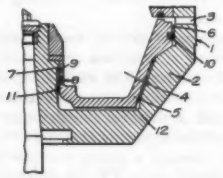
Klaus-Dieter Bröker, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator, Oelde, Fed. Rep. of Germany

Filed Mar. 2, 1984, Ser. No. 585,795

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308505

Int. Cl.³ B04B *3/08*

U.S. Cl. 494—40 **6 Claims**



1. In a self-emptying centrifuge drum with ejection openings controlled by an axially movable piston slide rotatable with the drum about an axis of rotation and having an inner surface facing the axis of rotation and an outer surface facing the drum, inner and outer centering means associated with the respective inner and outer surfaces of the piston slide and inside the drum for centering the piston slide relative to the axis of rotation, the outer centering means allowing the slide to move axially, the improvement comprising means mounting the piston slide to the drum without play and without axis motion at the inner centering means and axially elastically deformable means disposed between the inner and the outer slide centering means for allowing the piston slide to move axially and not radially in the vicinity of the outer centering means.

4,505,699

APPARATUS FOR MAKING ENVELOPES FROM A CONTINUOUS FILM SHEET

Mikio Totani, Muko, Japan, assignor to Totani Giken Kogyo Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 3, 1982, Ser. No. 354,334

Int. Cl.³ B31B *1/26;* **B65H** *35/10*

U.S. Cl. 493—196 **5 Claims**

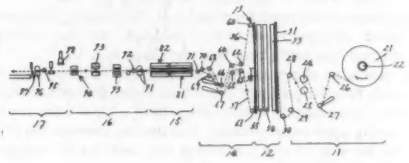
1. Apparatus for making envelopes from a continuous film sheet comprising:

means for supporting a film roll with its axis being substantially horizontally and kept so as to unwind therefrom as a continuous film sheet having a width extending in a horizontal direction,

means for changing the direction of extension of said width of the film sheet continuously unwound from said film roll so as to have said width in a vertical direction, said direction changing means comprising a vertically disposed slant plate having a slanting guide edge engaging said film sheet for changing the course of movement of the film sheet, and thereby the direction of extension of said width of the film sheet,

means for slitting the film sheet having its width extending in a vertical direction along its center line into two continuous strips,

means for adjusting the position of said slant plate in a vertical direction to maintain the center line of the film sheet



having its width extending in a vertical direction aligned with said slitting means,

means for changing the forwarding directions of said two continuous strips so as to be superposed on each other with their planes of extension being substantially horizontally kept,

means for heat-sealing said superposed strips in lengthwise and transverse directions to form a plurality of rectangular sections defined by heat-sealed sides, and

means for slitting and cutting the heat-sealed sheet into separated envelopes having their respective three heat-sealed edges.

4,505,700

CENTRIFUGE WITH A SELF-EMPTYING DRUM

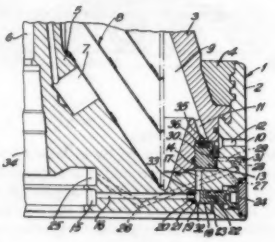
Karl-Heinz Zettier, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jan. 9, 1984, Ser. No. 569,015

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1983, 3305216

Int. Cl.³ B04B *11/04*

U.S. Cl. 494—30 **9 Claims**

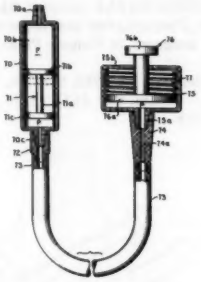


1. In a centrifuge with a self-emptying drum, having a jacket with ejection openings communicating with a solids space through channels, an annular valve body for blocking the channels, and a closure compartment associated with the valve body and receptive of closure fluid through a line, the improvement wherein: the line comprises two connected line components a hydraulically actuated piston for separating the two line components, wherein the piston has a flowthrough channel therein and further comprising an off-flow channel that is open to the atmosphere and wherein the flowthrough channel connects the one line component which opens into the closure compartment with the off-flow channel when the piston is in the separating state.

4,505,701
AUTOMATIC PARENTERAL INFUSION APPARATUS

Jose R. Navato, 3624 Blue Jacket Dr., Lee's Summit, Mo. 64063

Filed May 17, 1982, Ser. No. 378,628
Int. Cl.[3] A61M 5/00
U.S. Cl. 604—143 7 Claims



1. Automatic parenteral infusion apparatus to deliver infusion liquid to a patient at a substantially constant rate and pressure, said apparatus comprising:

a rigid shell having a hollow interior;

means within said shell defining an infusion liquid chamber being reducible in volume and adapted for containing infusion liquid;

means including a pressure source chamber spaced apart from said infusion liquid chamber to contain a pressure fluid and adapted to supply a substantially constant pressure within an expandable volume;

pressure transmission means interposed within said shell between said infusion liquid chamber means and said pressure source chamber means to transmit a substantially constant pressure from said pressure source chamber to said infusion liquid chamber;

delivery means connected to said infusion liquid chamber means to delivery infusion liquid at a controlled and constant rate of flow; and

vent means in said shell intermediate said infusion liquid chamber means and said pressure source chamber means to provide constant atmospheric communication with the interior of said shell at all times throughout delivery of infusion liquid to a patient whereby any pressure leakage from said pressure source chamber means is safely discharged to the atmosphere.

4,505,702
MANUALLY OPERABLE ROTARY SYRINGE

John R. Peery, Palo Alto, and James B. Eckenhoff, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Dec. 23, 1982, Ser. No. 452,552
Int. Cl.[3] A61M 5/00
U.S. Cl. 604—209 7 Claims

1. A rotary syringe comprising, in combination:

(a) a base member and a cap member rotable with respect to each other;

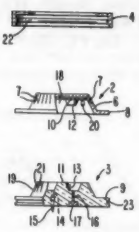
(b) an arcuate recess formed in the surface of one of said members;

(c) a plug extending from the other of said members and received in fluid sealing relationship with the surface of said arcuate recess;

(d) an outlet extending through said base member providing fluid communication between the exterior of said base member and said arcuate recess at a point proximate one end thereof;

(d) sealing means maintaining the abutting surfaces of said base and cap members in fluid tight relationship, and;

(f) means for permitting rotation of said cap member with respect to said base member only in the direction which translates said plug toward said outlet;

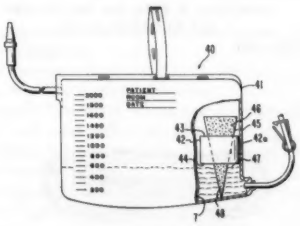


whereby upon rotation of said cap member on said base member, the plug means will be caused to traverse the arcuate recess forcing the contents of said recess through the outlet means.

4,505,703
FLUID RECEIVING RECEPTACLE HOUSING BIOCIDE DISPENSING DEVICE

Robert M. Gale, Mountain View, and John Urquhart, Palo Alto, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Sep. 29, 1982, Ser. No. 428,342
Int. Cl.[3] A61M 1/00
U.S. Cl. 604—317 2 Claims

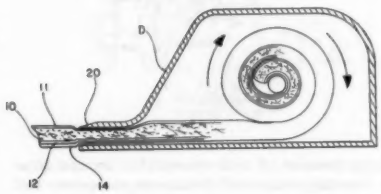


1. An improvement in a patient-care apparatus comprising in combination: (a) a receptacle for receiving and storing a biological fluid; an inlet port in the receptacle for establishing fluid passage between the interior and the exterior of the receptacle; and (b) a device in the receptacle for substantially controlling the presence of pathogens in the receptacle, said device consisting essentially of a body sized and adapted for prolonged placement in the receptacle and having an exposed surface that is contacted by fluid that enters the receptacle, the body being formed of a polymeric material containing a biocide, which biocide is released at the surface into the fluid for controlling the presence of pathogens; and wherein the improvement comprises the device being shaped such that a larger cross-sectional surface area is contacted by the fluid as the volume of fluid that enters the receptacle increases over the entire surface of the device and throughout a substantial portion of the height of the receptacle for releasing an increasing amount of biocide into the fluid that enters the receptacle and wherein the device is constrained in the receptacle such that a minimum of its exposed surface is at substantially the lower wall of the receptacle and is contacted by fluid that initially enters the receptacle for releasing biocide thereto.

4,505,704
SANITARY NAPKIN WITH MULTI-CONFIGURATIONAL CAPABILITIES

Robert J. Roeder, Outagamie County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 2, 1982, Ser. No. 403,991
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—385 **6 Claims**

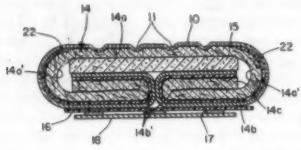


1. A sanitary napkin comprising a flexible elongated length of material comprising a fluid pervious cover, an absorbent matrix and a fluid impervious baffle, at least two longitudinal lines of attachment adhesive on said baffle, each of said baffle, said adhesive lines, cover and absorbent being substantially coterminous at their longitudinal edges and being at least 24 inches in length, said elongated length of material being devoid of predetermined detachable segments, said absorbent further defined by a dry cohesion value of not less than 0.8 Kg and a wet cohesion value of not less than 0.5 Kg.

4,505,705
SANITARY NAPKIN WITH FOLLOWING BAFFLE

Billie J. Matthews, Winnebago County, and S. Richard Bornslaeger, Outagamie County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 3, 1983, Ser. No. 471,599
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—385 **5 Claims**



1. An elongate sanitary napkin with essentially parallel longitudinal fold edges comprising, in combination:

(a) a first absorbent batt containing thermoplastic fibers with three horizontally disposed layers said batt having:

(1) a first layer with a continuous surface,

(2) a second layer with legs extending inward toward the longitudinal center of the pad formed by folding said first layer inward along each longitudinal edge;

(3) a third layer positioned between said first and second layers having legs overlying the legs of said second layer extending toward each longitudinal edge of said napkin from the longitudinal center and formed by folding each leg of said second layer inwardly upon itself said folding inwardly facing folds positioned proximally to each other near the longitudinal center of the pad;

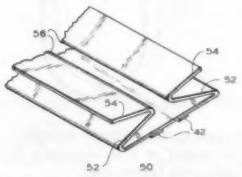
(b) a fluid permeable wrap overlying said first layer, the extreme portion of said folds forming the legs of said second layer, and the exterior portion of the folds forming the legs of said third layer and terminating at the ends of said legs of said third layer; and

(c) a fluid impermeable baffle positioned between said wrap and said absorbent except for that section of said wrap overlying the central portion of said first layer said baffle providing pathways for fluid flow within the napkin.

4,505,706
DISPOSABLE ADULT DIAPER

Emile Erpicum, Pont-a-Celles, and Louis Dehan, Neupre, both of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 14, 1983, Ser. No. 457,860
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—389 **4 Claims**

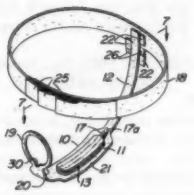


1. A disposable adult diaper arranged in a box-pleated configuration, comprising a top sheet, a fluid impervious backing sheet and an absorbent pad assembly sandwiched between said top sheet and said backing sheet, said absorbent pad assembly including a core of wood fluff and a bottom wadding sheet integrally bonded to said wood fluff, said core being bonded to said backing sheet, said top sheet being of a non-woven hydrophobic material and being of much greater width than said backing sheet so that end portions of said top sheet underlie said backing sheet and overlap each other, means bonding said end portions to said backing sheet and to each other at said overlap, pressure-sensitive adhesive strips on said overlap, and peelable strip means removably overlying said strips whereby said strips are centrally exposed by said box-pleated configuration.

4,505,707
MALE SANITARY DEVICE

Francis T. Feeney, No. 2 Windsor Ct., Lansdale, Pa. 19446

Filed Sep. 22, 1982, Ser. No. 421,505
Int. Cl.³ A61F *5/44*
U.S. Cl. 604—393 **10 Claims**



1. A contoured sanitary device for a man comprising:

(1) an annular front member constituting the sole support for said device by encircling the scrotum and penis;

(2) an elongated central portion for supporting a plurality of contoured absorbent pads superimposed one atop the other; and

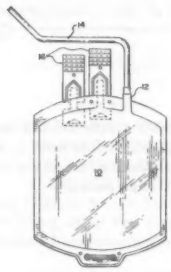
(3) a rear member equipped with means for detachably securing same to a garment and said rear member providing the sole support means for said device.

4,505,708

BLOOD COMPONENT STORAGE CONTAINER AND METHOD UTILIZING A POLYVINYL CHLORIDE PLASTIC FORMULATION FREE OR ESSENTIALLY FREE OF LEACHABLE MATERIALS

Henry M. Gajewski, Winnetka, and Paul Measells, Libertyville, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 27, 1982, Ser. No. 424,679
Int. Cl.[3] A61J 1/00; A61M 5/00
U.S. Cl. 604—408 8 Claims



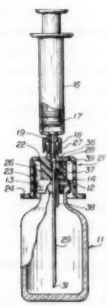
1. A method of storing platelets in a manner which minimizes the exposure of the platelets to blood extractable substances, said method comprising the step of storing the platelets in a flexible, plastic container, comprising a plasticized and heat stabilized polyvinyl chloride composition free of significantly leachable components and composed of polyvinyl chloride resin, an effective amount of tri(2-ethylhexyl) trimellitate for plasticizing said resin and a heat stabilization system selected from the group consisting of salts of C_{10} to C_{26} saturated fatty acids present in said polyvinyl chloride composition in an amount of from about 0.26 to about 0.35 parts per 100 parts resin by weight.

4,505,709

LIQUID TRANSFER DEVICE

Edward C. Froning, P.O. Box 1768, Rancho Santa Fe, Calif. 92067, and Gregory S. Graham, c/o Today's Machinery & Design, 2368 Eastman, #14, Ventura, Calif. 93002

Filed Feb. 22, 1983, Ser. No. 468,473
Int. Cl.[3] A61M 1/00
U.S. Cl. 604—411 4 Claims



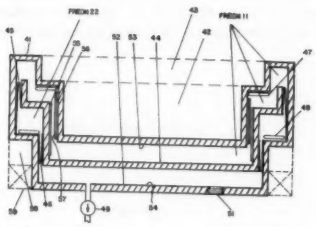
1. A device for use with a syringe for withdrawal of liquid from a container have a needle-pervious stopper comprising a body having a fitting on its top shaped for connection to a mating fitting on a syringe, said body being formed with a socket extending through said body, said body having a flat bottom end, a pointed first needle depending from said bottom end for puncturing said stopper communicating with said socket and a second needle depending from said bottom end to permit entry of air through said body and said stopper to replace, with air, liquid drawn out through said first needle and socket, said first and second needles comprising the only projection from said bottom end, and an opening to atmosphere formed in said body communicating with said second needle.

4,505,710

IMPLANTABLE FLUID DISPENSING SYSTEM

Earl R. Collins, 801 Craig Ave., La Canada, Calif. 91011

Filed May 13, 1983, Ser. No. 494,544
Int. Cl.[3] A61M 7/00
U.S. Cl. 604—891 5 Claims



1. A fluid dispensing device for implantation in a biological system, which comprises:

a container having a closed wall, a closed end, and an end having a first and a second aperture;

a unidirectional flow valve in said first aperture, adapted to conduct fluid away from said container;

fill valve means in said second aperture adapted to conduct fluid into said container;

a reciprocable diaphragm in said container, defining a first volume between the closed end of said container and said diaphragm, and a second volume between said diaphragm and said end having first and second apertures;

a gas in the first volume of said container;

a first heater in thermal contact with said gas in the first volume in said container, for expanding said gas;

an expandable container having first and second concentric, closed, expandable walls and first and second ends, in said container, in contact with said diapragm at the first end, and in contact with the aperture end of said container at the second end, said expandable container surrounding a third volume inward from said first and second concentric expandable walls and between said diaphragm and the aperture end of said container;

a gas in said expandable container; and

a second heater in thermal contact with said gas in said expandable container for expanding said gas;

control means connected to said first and second heater adapted to actuate said first and said second heaters autonomously from stored instructions in said control means;

whereby said control means energizes said heaters differentially, urging said diaphragm in one direction or its opposite, forcing fluid out of said unidirectional valve and alternately drawing in fluid through said fill valve means to fill the dispensable fluid third volume in said container.

4,505,711

DEPOSIT DEVICE FOR DELIVERING BIOLOGICALLY ACTIVE SUBSTANCES TO THE DIGESTIVE TRACT AND METHOD OF USING SAME

Joshua M. S. Lucas, High Ongar, England, assignor to May & Baker Limited, Essex, England

Filed Jun. 18, 1982, Ser. No. 390,139

Claims priority, application United Kingdom, Jun. 24, 1981, 8119471

Int. Cl.[3] **A61K** *9/00, 9/22*

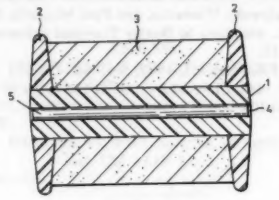
U.S. Cl. 604—892 **13 Claims**

1. A deposit device formed of a biocompatible material, for delivering a biologically active substance to the digestive tract, comprising

(a) substantially solid elongate carrier body means;

(b) respective external flange means near the ends of said elongate carrier body means and projecting radially outwardly therefrom to define between them an annular space to receive a said biologically active substance the ratio of flange diameter to elongate carrier body diameter being greater than about 3:1; and

(c) carried by the elongate carrier body means in said space between said external flange means, a load comprising a mass of biologically active substance, mounted solely on and around the carrier body and carried solely by said flange means and said carrier body, the assembly of the



elongate carrier body means and the load thereon has an overall specific gravity of at least 2, and wherein said assembly is free of sharp edges likely to cause trauma in the digestive tract of an animal.

4,505,712

CYCLIC UREA/GLYOXAL/POLYOL CONDENSATES AND THEIR USE IN TREATING TEXTILE FABRICS AND PAPER

William C. Floyd, Chester, and Bernard F. North, Rock Hill, both of S.C., assignors to Sun Chemical Corporation, New York, N.Y.

Division of Ser. No. 513,629, Jul. 14, 1983, Pat. No. 4,455,416.
This application Feb. 13, 1984, Ser. No. 579,517
Int. Cl.[3] D06M *13/34*
U.S. Cl. 8—186 5 Claims

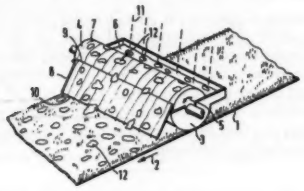
1. A process for producing a crease-resistant cellulosic textile fabric which comprises impregnating a textile with a solution of a cyclic urea/glyoxal/polyol condensate and a catalyst and heating the impregnated textile to cure the composition thereon.

4,505,713

METHOD AND APPARATUS FOR APPLYING PATTERNS TO A PLANAR STRUCTURE FROM DYE PATCHES FLOATED DOWN RAMP ON FILM OF CARRIER FLUID

Herbert Eichmanns; Wilhelm Meyer, both of Krefeld, and Winfried Kemper, Wegberg, all of Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik, Krefeld, Fed. Rep. of Germany

Division of Ser. No. 120,470, Feb. 11, 1980, Pat. No. 4,375,158.
This application Mar. 1, 1983, Ser. No. 471,000
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2905945
Int. Cl.[3] D06B *1/04;* B05C *9/02;* B05D *1/30*
U.S. Cl. 8—483 25 Claims



1. A method for applying patterns to a structure moving in a longitudinal direction which is maintained in a planar state during application of the patterns, said method comprising the steps of:

forming a layer of carrier liquid extending transversely to said longitudinal direction;

adding a pattern liquid in individually spaced apart quantities to said carrier liquid; and

transferring said layer of carrier liquid with at least some of the individual quantities of pattern liquid simultaneously from above onto a surface of said moving structure.

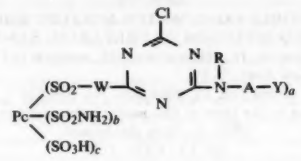
4,505,714

PHTHALOCYANINE FIBER REACTIVE COMPOUND

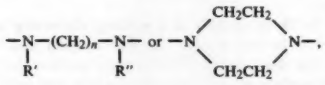
Takashi Omura, Ashiya; Mikoto Takahashi, Toyonaka; Naoki Harada, Ibaraki, and Akira Takeshita, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 13, 1984, Ser. No. 579,546
Claims priority, application Japan, Feb. 17, 1983, 58-25986
Int. Cl.[3] C09B *47/03, 62/51;* D06P *1/38, 3/66*
U.S. Cl. 8—549 8 Claims

1. A compound represented by a free acid of the following formula,



wherein Pc is a metal-free or metal-containing phthalocyanine residue, W is a group of



in which R′ and R″ are independently a hydrogen atom or a methyl or ethyl group, and n is an integer of from 2 to 6, R is an unsubstituted or substituted lower alkyl group, A is an unsubstituted or substituted phenylene or naphthylene group, Y is a group of $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Z$ in which Z is a group capable of being split by the action of an alkali, a is a positive number of from 1 to 3, and b and c are independently a positive number of from 0 to 3, provided that a, b and c satisfy $0<a+b+c\leqq 4$.

4,505,715

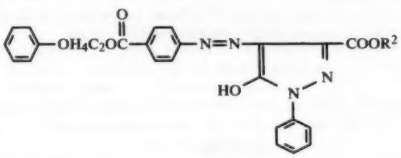
MONOAZO DYESTUFF MIXTURES TO DYE POLYESTER YELLOW

Toshio Niwa; Kiyoshi Himeno, both of Yokohama, and Junji Yoshihara, Sagamihara, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,392
Claims priority, application Japan, Jun. 13, 1983, 58-105455
Int. Cl.[3] C09B *29/01*
U.S. Cl. 8—639 5 Claims

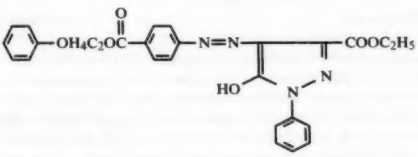
1. A monoazo dyestuff mixture which comprises 90–30% by weight of a monoazo dyestuff of the general formula [II]:

[II]



wherein R^2 is C_{3-6} alkyl, C_{1-4} alkoxyalkyl, phenoxyalkyl or aralkyl and 10–70% by weight of a monoazo dyestuff of the formula [III]:

[III]



4,505,716

COMBUSTIBLE COAL/WATER MIXTURE FOR FUELS AND METHODS OF PREPARING SAME

Edgar W. Sawyer, Jr., Hagerstown, Md., assignor to ITT Corporation, New York, N.Y.

Filed Feb. 15, 1984, Ser. No. 580,513
The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.
Int. Cl.[3] C10L *1/32*
U.S. Cl. 44—51 39 Claims

1. A combustible fuel slurry comprising:

greater than about 70% to about 75% by weight coal powder in particulate form and having a rounded particle shape;

from 0.5–5% by weight of a wetting/dispersing agent selected to be low to non-foaming in water and having a structure that consists of an organic portion that absorbs on the surface of said coal particles with said agent having a charged hydrophilic portion that is lyophilic to the continuous water phase;

a clay stabilizing composition in the form of a predispersion comprising a clay stabilizer, a clay dispersant and water wherein the amount of clay stabilizer in the fuel slurry is from 0.15 to 0.8% by weight; and

the remainder of said fuel being water, whereby the clay stabilizer, when added to the fuel slurry, provides a stabilizing gel structure for the slurry.

4,505,717

CORROSION INHIBITED MOTOR FUEL

Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,554
Int. Cl.[3] C10L *1/22*
U.S. Cl. 44—53 26 Claims

1. A fuel composition for internal combustion engines comprising

(a) a major portion of a fuel containing (i) at least one alcohol selected from the group consisting of ethanol and methanol and (ii) gasoline in amount of 0–50 volumes per volume of alcohol; and

(b) a minor corrosion inhibition amount of, as a corrosion inhibiting agent, a reaction product in polar solvent of (i) a di-(hydrocarbonyl secondary amine and (ii) an isatoic anhydride; further reacted at ambient temperature with a (C_2–C_3 alkoxy) (C_{10}–C_{12} alkoxy) primary amine.

4,505,718

ORGANO TRANSITION METAL SALT/ASHLESS DETERGENT-DISPERSANT COMBINATIONS

Casper J. Dorer, Jr., Lyndhurst, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 227,330, Jan. 22, 1981, abandoned. This application Aug. 20, 1982, Ser. No. 410,123
Int. Cl.[3] C10L *1/22, 1/30*
U.S. Cl. 44—66 11 Claims

1. A fuel composition comprising:

a major amount of a solid fuel or middle distillate fuel, and

a minor fuel efficiency improving amount of a mixture of

(A) one or more overbased transition metal salts of at least one organic acid, said organic acid being selected from the group consisting of carboxylic acid, phosphoric acid, sulfonic acid and mixtures thereof; and

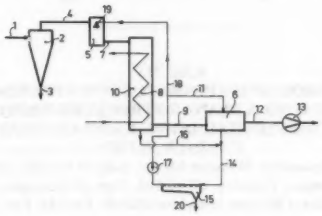
(B) at least one hydrocarbon-soluble ashless dispersant.

4,505,719

PROCESS FOR CLEANING AND COOLING PARTIAL OXIDATION GASES CONTAINING DUST-LIKE POLLUTANTS

Eberhard Goeke, and Jürgen Ludolph, both of Essen, Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 146,174, May 2, 1980, abandoned, which is a continuation of Ser. No. 936,475, Aug. 24, 1978, abandoned. This application Nov. 1, 1982, Ser. No. 437,906
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1977, 2739562
Int. Cl.[3] C10J *3/16*
U.S. Cl. 48—202 6 Claims



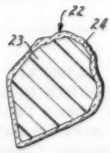
1. In the process of cleaning and cooling partial oxidation gases which are produced by gasification of coal dust in a Koppers-Totzek gasifier (entrained-bed gasifier) in which process the hot gases are passed to a mechanical dust separator where about 70 to 95% of the pollutants are eliminated and the gases are then washed in a wet cleaner with water in an amount not greater than is required to eliminate the residual dust; the improvement of cooling the gases leaving the dust separator in a direct cooler to a temperature of about 75°–85° C., close to the dew point thereof but only to the extent that no condensation of steam takes place, thereafter further cooling the gases in an indirect cooler to a temperature which is 5° to 10° C. above the temperature of the cooling water at its entry into the indirect cooler, and then introducing said cooled gases into the wet cleaner for further treatment therein.

4,505,720

GRANULAR SILICON CARBIDE ABRASIVE GRAIN COATED WITH REFRACTORY MATERIAL, METHOD OF MAKING THE SAME AND ARTICLES MADE THEREWITH

Thomas Gabor, Maplewood; David E. Broberg, Woodbury; Gunther H. Dierssen, White Bear Lake, and Donley D. Rowenhorst, North St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 29, 1983, Ser. No. 508,852
Int. Cl.[3] B24D *11/00*
U.S. Cl. 51—295 27 Claims

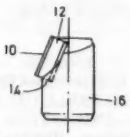


1. Granular abrasive material comprising silicon carbide, each particle thereof characterized by being coated over at least a part of its surface with an integral, durable, adherent coating consisting essentially of hard refractory material comprising metal nitride or carbide.

4,505,721
ABRASIVE BODIES

Eric A. Almond, 34 Weston Ave., West Molesey, Surrey, KT8 9RG, and Mark G. Gee, 20, Morland Close, Hampton, Teddington, Middlesex, both of England

Filed Mar. 30, 1983, Ser. No. 480,484
Claims priority, application United Kingdom, Mar. 31, 1982, 8209409; Jan. 31, 1983, 8302620
Int. Cl.³ B24D 3/02
U.S. Cl. 51—309 17 Claims



1. A method of making an abrasive body comprising an abrasive compact, a backing of cemented carbide bonded to the abrasive compact, and a metal-containing substrate bonded to the backing through a bonding layer comprising nickel, copper, cobalt, iron or an alloy containing one or more of these metals, including the steps of:

(a) providing a composite abrasive compact comprising an abrasive compact bonded to a cemented carbide backing:

(b) depositing a layer of nickel, copper, cobalt, iron or an alloy containing one or more of these metals on a surface of a metal-containing substrate, applying a transverse pressure to the layer, raising the temperature of the layer to a temperature below its melting point and maintaining the pressure and temperature for a period sufficient to enable the layer to bond to the substrate;

(c) polishing the exposed surface of the metal layer;

(d) bringing the backing and substrate together so that the polished surface of the metal layer contacts a surface of the backing;

(e) urging the backing and substrate together by applying a transverse pressure thereto;

(f) raising the temperature of the metal layer to a temperature below its melting point and in the range 650° to 750° C.; and

(g) maintaining the pressure and temperature for a time sufficient to cause diffusion bonding between the backing and the substrate

steps (f) and (g) being carried out in an inert atmosphere.

4,505,722
GAS TREATING APPARATUS AND PROCESS

L. C. Shelton, Jr., Pampa, Tex. 79065

Filed Jun. 27, 1983, Ser. No. 508,460
Int. Cl.³ B01D 47/06, 47/12
U.S. Cl. 55—89 8 Claims

1. A vapor liquid contact tower for absorbing liquid from gas-liquid mixtures, said tower having a gas inlet and outlet and comprising:

a liquid absorption section positioned in said tower so that gas passes therethrough from its bottom to its top;

spray nozzle means positioned in the tower at said liquid absorption section for introducing cooled pressurized absorbing liquid into said liquid absorption section;

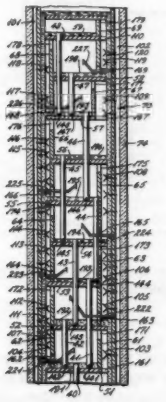
a liquid collection section beneath said liquid absorption section; and

liquid outlet means positioned in said tower such that, the absorbing liquid flows from said liquid absorption section to said liquid collection section then to said outlet means,

said liquid absorption section being a portion of the tower shell and at least one longitudinal absorption unit located inside of and supported by the shell, with said at least one absorption unit comprising:

a plurality of horizontal plates spaced-apart and spaced from the shell, creating thereby an annulus between each plate and the shell and also a chamber between adjacent plates;

vertical liquid conduits interconnecting said plurality of plates, said vertical liquid conduits including a conduit extending down from adjacent each plate to drain liquid collected thereon to a lower plate; and vertical gas conduits, positioned adjacent the shell, said vertical gas conduits including a gas conduit connecting each pair of superposed adjacent chambers for flow of gas upward, chamber by chamber, through said at least one absorption unit and thereby through said liquid absorption section,



said spray nozzle means for introducing absorbing liquid including at least one spray nozzle supported by the tower shell positioned for spraying liquid inside each vertical gas conduit, the absorbing liquid so introduced flowing from the gas conduit onto one of said plates subjacent thereto;

said plates and conduits being firmly fixed together and thereby being a unitary plate and conduit absorption unit supported by said shell so as to permit relative movement between component portions of said at least one plate and conduit absorption unit and the tower shell.

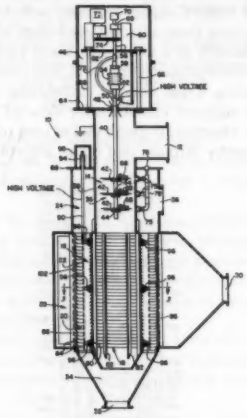
4,505,723
FILTER APPARATUS

Karim Zahedi, Newton; Jeffrey C. Alexander, Essex, and Peter B. Zieve, Arlington, all of Mass., assignors to EFB Inc., Woburn, Mass.

Continuation of Ser. No. 312,962, Oct. 20, 1981, abandoned.
This application Jun. 24, 1983, Ser. No. 507,947
Int. Cl.³ B03C 3/74
U.S. Cl. 55—117 18 Claims

1. Filter apparatus for polluted gas comprising means including inner and outer vertical cylindrical cages for retaining a tubular bed of granules in a space therebetween with the bed surrounding an internal gas passage defined by the inner cylindrical cage, said internal gas passage having an inlet for gas at its upper end, said space having an inlet for granules at its upper end and an outlet for granules at its lower end, a gas outlet plenum surrounding said cages, means including a vertical cylindrical electrode between said inner and outer cages for applying an electrical potential across the bed of granules, means including a vertical tube extending downwardly to the inlet of said internal gas passage in alignment with said inner cylindrical cage for introducing polluted gas to said internal gas passage from above and for causing the gas to flow through the bed from the inside out, and ionizer means for electrically

charging pollutant particles within the gas prior to introduction to said passage, the ionizer means being restricted to said



tube for creating an ionizing discharge confined within the tube above said passage.

4,505,724

WET-PROCESS DUST-COLLECTING APPARATUS ESPECIALLY FOR CONVERTER EXHAUST GASES

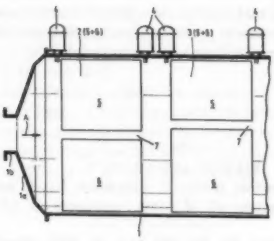
Heribert Baab, Frankfurt am Main, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,859

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1982, 3215400

Int. Cl.³ B03C *3/74*

U.S. Cl. 55—118 **4 Claims**



1. A wet-process electrostatic precipitator, especially for the removal of particulates from a metallurgical converter waste gas, comprising:

a pressure-resisting horizontally disposed axially elongated cylindrical housing traversed axially by said gas;

a plurality of collecting fields axially spaced apart in said housing and each comprising a plurality of transversely spaced mutually parallel upper vertical collecting plates extending in the direction of gas flow, and a plurality of transversely spaced mutually parallel lower vertical collecting plates extending in the direction of the flow below the respective pluralities of upper plates so that the upper and lower plates of each field form respective field sections vertically subdivided from one another;

upper corona electrodes disposed in said housing between said upper plates and lower corona electrodes disposed in said houses between lower plates of each field and in gas flow channels defined between said plates, the upper and lower plates and corona electrodes of each field being separated by a horizontal separating plane between the respective sections; and

rinsing means including nozzles for each of said fields directing a rinsing liquid onto said plate to wash collected particulates therefrom, the separating planes of successive fields in the direction of gas flow being vertically staggered, the collecting plates of each section of each field being transversely offset from the collecting plates of an adjoining section of the same field by a distance equal to half the width of the gas channels defined between the collecting plates of each section.

4,505,725

FUEL ADDITIVES FROM BORATED, ACID-TREATED MIXTURES OF VEGETABLE OIL DERIVED AMIDES AND ESTERS

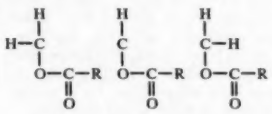
Alexander D. Schuettenberg, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 20, 1984, Ser. No. 572,268

Int. Cl.³ C10L *1/30*

U.S. Cl. 44—66 **14 Claims**

1. A composition useful as a detergent additive for fuels comprising the reaction product prepared by reacting multiamine with vegetable oil to obtain a first product mixture, said vegetable oil selected from triglycerides of long-chain monocarboxylic acids of the formula



where R is an aliphatic radical of 10 to about 25 carbon atoms, said first product mixture further reacted with sulfonic acid to obtain a second product mixture and said second product mixture further reacted with a boron-containing suitable to provide a boron content of about 2000 to about 100,000 ppm in a final product.

4,505,726

EXHAUST GAS CLEANING DEVICE

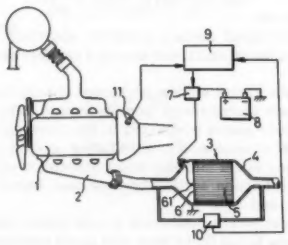
Yukihisa Takeuchi, Chita, and Masahiro Tomita, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed May 17, 1983, Ser. No. 495,404

Claims priority, application Japan, May 18, 1982, 57-83723

Int. Cl.³ B01D *46/48;* F01N *3/02*

U.S. Cl. 55—282 **8 Claims**



1. An exhaust gas cleaning device for collecting carbon particulates in exhaust gases discharged from an engine and burning off the collected carbon particulates, comprising:

a casing having an inlet port and a discharge port for introducing and discharging said exhaust gases;

a honeycomb structured filter member for collecting carbon particulates in said exhaust gases, which is disposed within said casing between said inlet port and said discharge port; said filter member being made of heat resistant ceramic and being provided with a large number of intersecting porous walls which define a large number of inlet gas passages and a large number of outlet gas passages so as to be adjacent to each other; the upstream end of each of said inlet gas passages being open while the downstream end thereof is closed by a downstream end wall and the upstream end of each of said outlet gas passages being closed by an upstream end wall while the downstream end thereof is open;

an electric heater for heating the carbon particulates collected by said filter member; said electric heater being composed of at least one film-shaped heating resistor which is directly formed on said upstream end wall of said filter member so as to be integral therewith; and

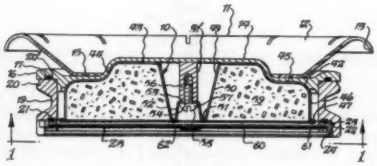
an electric current supplying means for supplying electric current to said electric heater; said electric current supplying means comprising a positive electrode and a negative electrode, which are electrically connected to said electric heater, respectively.

4,505,727

ADSORBENT CARTRIDGE

John S. Cullen, Buffalo; Samuel A. Incorvia, and James A. Vogt, both of Tonawanda, all of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed Nov. 25, 1983, Ser. No. 555,133
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—387 **12 Claims**



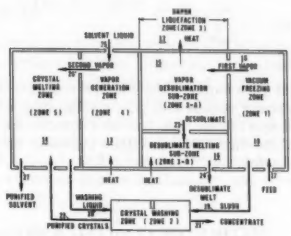
1. In a device having a surface which may be oriented in a downwardly facing attitude, an adsorbent cartridge comprising a casing including a substantially rigid self-sustaining dish-shaped first side having a central portion and an outer portion lying outwardly of said central portion, a second side of permeable sheet material secured relative to said outer portion of said dish-shaped first side, adsorbent in said casing confined between said first and second sides, and mounting means on said central portion of said first side for mounting said casing with said first side in contiguous relationship to said surface and with said second side facing away from said surface and exposed to the environment proximate said surface, said mounting means comprising an elongated shell-like member extending toward said second side from said central portion, said shell-like member having first and second ends, said first end being secured to said central portion of said dish-shaped first side, and a bearing surface on said second end, said self-sustaining substantially rigid first side maintaining said casing in its fabricated contour and said second side of permeable sheet material permitting gases to pass therethrough into said cartridge.

4,505,728

VACUUM FREEZING MULTIPLE PHASE TRANSFORMATION PROCESS AND APPARATUS FOR USE THEREIN

Chen-Yen Cheng, 9605 La Playa St. NE., Albuquerque, N. Mex. 87111, and Sing-Wang Cheng, 8228 Pickard Ct. NE., Albuquerque, N. Mex. 87110

Continuation-in-part of Ser. No. 315,858, Oct. 28, 1981, Pat. No. 4,420,318. This application Aug. 25, 1983, Ser. No. 526,261
Int. Cl.³ B01D *9/04*
U.S. Cl. 62—542 **20 Claims**



10. A process of conditioning a feed mixture that is chosen from a group that comprises municipal waste water sludge, aqueous gelatinous substances, industrial waste sludge and organic gels through freezing and thawing operations that comprises the following steps:

(a) A vacuum freezing step of flash vaporizing feed mixture in a vacuum freezing zone to form a first vapor and a first condensed mass containing solvent crystals and the remaining mass, the pressure of the first vapor being lower than the triple point pressure of the solvent;

(b) A two stage vapor liquefaction step of transforming the first vapor into solvent liquid in a vapor liquefaction zone comprising at least one vapor desublimation sub-zone and at least one desublimate melting sub-zone involving (i) a sub-step of desubliming the first vapor to form a desublimate mass in the vapor desublimation sub-zone by introducing the first vapor into the sub-zone and removing heat therefrom and (ii) a sub-step of melting a mass of the desublimate in the desublimate melting sub-zone by locating the desublimate in the sub-zone and supplying heat thereto, the melt of the desublimate being solvent liquid;

(c) A vapor generation step of transforming a mass of solvent liquid into a second vapor in a vapor generation zone by supplying heat thereto, the pressure of the second vapor being somewhat higher than the triple point pressure of the solvent;

(d) A crystal melting step of bringing the second vapor in contact with solvent crystals derived from the first condensed mass in a crystal melting zone to thereby melt the crystals and condense the vapor;

wherein all of the latent heat required in melting the solvent crystals is providable by the latent heat released in condensing the second vapor.

4,505,729

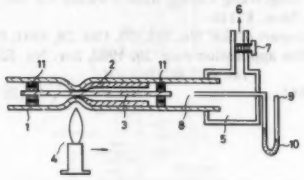
METHOD OF PRODUCING OPTICAL FIBER PREFORM

Hiroyoshi Matsumura, Iruma; Toshio Katsuyama, Hachioji, and Tsuneo Suganuma, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 14, 1983, Ser. No. 542,186
Claims priority, application Japan, Oct. 15, 1982, 57-179857
Int. Cl.³ C03C *25/02*
U.S. Cl. 65—3.11 **21 Claims**

1. A method of producing an optical fiber preform comprising (i) forming a glass thin film to become a clad layer, a glass thin film to become a jacket layer, or glass thin films to become a jacket layer and a clad layer, on a inner wall of a glass mother

tube, (ii) inserting a glass rod to become a core or a glass rod to become a core and a clad, into said glass mother tube, and (iii) heating the glass mother tube, with said glass rod inserted therein, to a predetermined temperature and at a pressure



inside said glass mother tube which is reduced to a value lower than a pressure outside said glass mother tube, to thereby make said glass thin film or films into an elliptical shape and to make said glass mother tube, said glass thin film or films and said glass rod solid.

4,505,730

METHOD OF COOLING A MOULD

Thomas V. Foster, Cantley, England, assignor to Emhart Industries, Inc., Farmington, Conn.

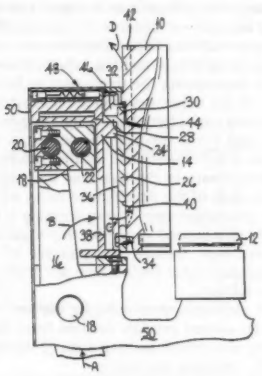
PCT No. PCT/GB82/00057, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/02883, PCT Pub. Date Sep. 2, 1982

PCT Filed Feb. 22, 1982, Ser. No. 433,123

Claims priority, application United Kingdom, Feb. 27, 1981, 8106259

Int. Cl.³ C03B 9/38

U.S. Cl. 65—162 **7 Claims**



1. In a mold apparatus of a glassware forming machine including a mold opening and closing mechanism operable to move at least one movable mold portion of the mold into engagement with other mold portions to form a closed mold or out of engagement with the other mold portions to open the mold, said mechanism having a movable mold portion support to which the movable mold portion is mounted,

an improved movable mold portion support comprising:

a movable mold portion holder; and

an intermediate support holder which supports the movable mold portion and is mountably attached to the mold portion holder by means of a slot in the intermediate support member and a mating projection in the mold portion holder, said mating projection being loosely confined within said slot,

wherein said intermediate support member and movable mold portion holder define a space therebetween to thermally insulate the movable mold portion holder from the movable mold portion, and said movable portion holder defines a passage providing access to said space to permit flow of cooling air into said space.

6. In a mold apparatus of a glassware forming machine including a mold opening and closing mechanism operable to move at least one movable mold portion of the mold into engagement with other mold portions to form a closed mold or out of engagement with the other mold portions to open the mold, said mechanism having a movable mold portion support to which the movable mold portion is mounted,

an improved movable mold portion support comprising:

a movable mold portion holder; and

an intermediate support member which supports the movable mold portion and is demountably and loosely attached to the movable mold portion holder, said intermediate support member and said movable mold portion holder defining an air space therebetween to thermally insulate the mold portion holder from said movable mold portion, and said movable mold portion holder defining a passage providing access to said space to permit the flow of cooling air into said space,

wherein the intermediate support member has at least one aperture therein with an entrance at a lower region of the movable mold portion into which cooling air passes from the space, to inpinge upon the movable mold portion, and exit near an upper region of the movable mold portion.

4,505,731

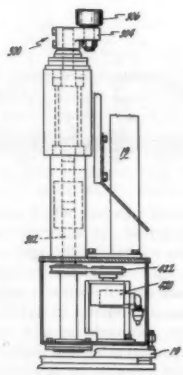
DELIVERY DRIVE FOR GLASSWARE FORMING MACHINE

Nicholas G. Morris, Windsor; Charles M. Kingsbury, Manchester, and Bruce R. Beckwith, Unionville, all of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 4, 1983, Ser. No. 472,363

Int. Cl.³ C03B 9/44

U.S. Cl. 65—225 **4 Claims**



1. An improved glassware forming machine of the rotating table type which includes a plurality of blank molds continuously rotated around a central axis; at least two gob guiding units each for periodically delivering a gob of glass to one of said blank molds, each of said gob guiding units comprising a scoop, a trough, and a deflector; and a drive assembly for oscillating each of the gob guiding units over a path overlapping the path of one of the blank molds; wherein the improvement comprises an improved drive assembly, comprising:

a drive shaft having a crank and associated crank roller directly secured to the end thereof;

a crank box secured to one of said gob guiding units, said crank box housing said crank roller; and

a connecting link pivotably secured to at least one of said gob guiding units for, upon rotation of said drive shaft, transferring the motion of said one of gob guiding units to the other.

4,505,732

SOLID, WATER-SOLUBLE MICRONUTRIENT MIXTURES, THEIR PREPARATION AND USE

Heinrich Aigner, Dülmen; Norbert Merget; Jürgen Norden, both of Bochum; Manfred Schweppe, Herne, and Klaus Wetter, Essen, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany

Filed Sep. 9, 1982, Ser. No. 416,102

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136164

Int. Cl.[3] **C05G** *3/00*

U.S. Cl. 71—11 **5 Claims**

1. A fertilizer concentrate composition comprising:

(1) 80–90%, by weight, of water-soluble salts of plant micronutrients, 10–18 mole percent of said salts being complexed with a complexing agent; and

(2) 0.7–1.75%, by weight, of a polyetheylene oxide stabilizer in powder form having a particle size such that 80–90% by weight, of said particles have a diameter of <0.1 mm and less than 0.5 percent, by weight, of said particles have a diameter >0.5 mm in diameter, and wherein said poyethylene oxide stabilizer has an average molecular weight of 5000 to 7000 grams/mole and a solidification point of 55° to 58° C.;

with the balance, being a complexing agent for said micronutrients, with the proviso that the amount of complexing agent is chosen so that 10–18 mole percent of the micronutrients are complexed.

4,505,733

PROCESS FOR PRODUCING LIQUID COMBINED FERTILIZERS

Mikhail V. Lykov, Simonovsky val, 22, korpus 2, kv. 149, Moscow; Vladimir M. Lembrikov, ulitsa Novlyanskaya, 8, kv. 1, Voskresensk Moskovskoi; Svetlana I. Golovkina, Kashirskoe shosse, 88, korpus 2, kv. 268, Moscow; Nadezhda N. Malakhova, ulitsa Mendeleeva, 3, kv. 70; Vladimir N. Sterlin, ulitsa Novlyanskaya, 8b, kv. 52, both of Voskresensk Moskovskoi; Viktor N. Kochetkov, ulitsa Shvernika, 5, korpus 1, kv. 22, and Gennady M. Markovin, 6 Mikroraion Teplogo Stana, korpus 89, kv. 94, both of Moscow, all of U.S.S.R.

Filed Feb. 2, 1984, Ser. No. 576,116

Int. Cl.[3] **C05B** *7/00*

U.S. Cl. 71—34 **3 Claims**

1. A process for producing liquid combined fertilizers comprising neutralization of extraction phoshoric acid with an excess of gaseous ammonia taken in an amount of 1–1.2 parts by weight of its content in the final product at a temperature of the reagents ranging from 60° to 250° C., mixing the products of neutralization with a liquid phase consisting of water, or ammonia water and a portion of the final product recycled to the process, said mixing being conducted under a pressure of 0.05–0.7 atm and at an excess of water in the liquid phase of 1.05–2.0 parts by weight relative to its content in the final product; the process being carried out at a ratio of circulation of the final product of 2 to 40 and at a pressure differential at the stages of neutralization and mixing within the range of from 0.1 to 6 atm.

4,505,734

COPPER BASED ALGAECIDES AND AQUATIC HERBICIDES

Carol B. Freedenthal; Marion D. Meyers, and Graham A. Stoner, all of Houston, Tex., assignors to Kocide Chemical Corporation, Houston, Tex.

Continuation of Ser. No. 323,307, Nov. 20, 1981, abandoned, which is a continuation of Ser. No. 162,379, Jun. 23, 1980, abandoned, which is a continuation of Ser. No. 744,299, Nov. 23, 1976, abandoned, which is a continuation of Ser. No. 579,805, May 22, 1975, abandoned, which is a continuation of Ser. No. 397,136, Sep. 13, 1973, abandoned. This application Aug. 9, 1983, Ser. No. 521,636

Int. Cl.[3] **A01N** *33/04*

U.S. Cl. 71—67 **14 Claims**

1. A water soluble aqueous concentrate comprising a water solution of a complex of copper hydroxide and a trialkanolamine or mixture of a trialkanolamine and a dialkanolamine containing a major proportion of trialkanolamine, such alkanolamines having 2 to 6 carbon atoms in the alkanol moieties, the ratio of alkanolamine to copper hydroxide being in the range of from 1:1 to 3:1, said solution containing from 7 to 10 percent copper expressed as elemental copper, and wherein the pH is from 8.7 to 9.8.

4,505,735

TETRA-N-SUBSTITUTED UREA DERIVATIVES AS HERBICIDES

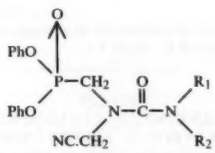
Rajendra K. Singh, Maryland Hts., Mo., assignor to Monsanto Co., St. Louis, Mo.

Filed Jan. 20, 1983, Ser. No. 459,447

Int. Cl.[3] **A01N** *57/22, 57/24;* **C07F** *9/40, 9/65*

U.S. Cl. 71—086 **4 Claims**

1. A compound having the formula:



where each Ph is a phenyl group and R_1 and R_2 are each individually methyl or ethyl groups or, together with the nitrogen privide a morpholino radical.

4,505,736

N-PHOSPHONOMETHYLGLYCINE DERIVATIVES AND USE AS HERBICIDES

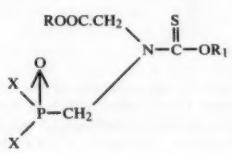
John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 11, 1983, Ser. No. 493,457

Int. Cl.[3] **A01N** *57/10, 57/18;* **C07C** *155/02*

U.S. Cl. 71—76 **9 Claims**

1. A compound having the formula:



wherein R is selected from the group consisting of hydrogen and C_1 to C_6 alkyl groups; R_1 is selected from C_1 to C_6 alkyl, phenyl and C_6–C_{10} aralkyl groups; and the Xs can be identical

or different and are individually selected from the group consisting of hydroxyl and —OM wherein M is a salt-forming cation.

5. A herbicidal method which comprises application to a plant of a herbicidally-effective amount of an agriculturally-acceptable compound according to claim 1.

4,505,737

SYNERGISTIC HERBICIDAL COMPOSITIONS

Gerald H. Thiele, Sunnyvale, Calif., and David L. Stamp, Albion, Nebr., assignors to Stauffer Chemical Company, Westport, Conn.

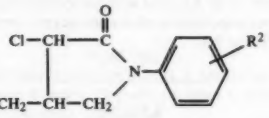
Continuation of Ser. No. 108,602, Jan. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 15,553, Feb. 26, 1979, abandoned. This application Feb. 23, 1981, Ser. No. 236,969

Int. Cl.[3] **A01N** *57/00, 43/36*

U.S. Cl. 71—86 **4 Claims**

1. A synergistic herbicidal composition consisting essentially of a mixture of

(a) an effective amount of a pyrrolidone of the formula



in which R^2 is trifluoromethyl, and

(b) an effective amount of a phosphonic acid of the formula

in wich R^4 is C_1–C_4 haloalkyl, at a weight ratio of (a) to (b) of from about 1:8 to about 4:1.

4,505,738

HALOVINYL-3,3-DIMETHYLCYCLOPROPANECARBOXYLIC ACID PYRONYL ESTERS USEFUL FOR THE PROTECTION OF CULTIVATED PLANTS AGAINST THE HARMFUL EFFECTS OF HERBICIDES

Laurenz Gsell, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

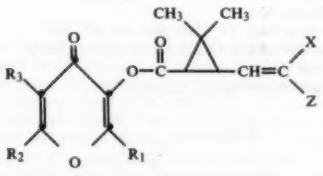
Filed May 4, 1983, Ser. No. 491,160

Claims priority, application Switzerland, May 10, 1982, 2891/82

Int. Cl.[3] **A01N** *43/28;* **C07D** *309/32*

U.S. Cl. 71—88 **28 Claims**

1. A compound of the formula I



(I)

wherein R_1, R_2 and R_3 independently of one another are each hydrogen; halogen; C_1–C_8-alkyl which is unsubstituted or substituted by one or more substituents from the group: thiocyanogen, hydroxyl, halogen, C_1–C_4-alkoxy, C_1–C_4-alkylthio, acyloxy or R_4; or they are each C_3–C_6-alkenyl which is unsubstituted or substituted by R_5; or they are C_3–C_6-alkynyl which is unsubstituted or substituted by R_6; or they are R_7, whereby R_4, R_5, R_6 and R_7 are phenyl which is unsubstituted or substituted by a maximum of three identical or different substituents from the group: halogen, nitro, cyano, carboxylic acid, carboxylic acid alkyl ester, alkyl, alkenyl, alkynyl, haloalkyl, alkoxy or alkylthio; and X and Z are fluorine, chlorine, bromine or trifluoromethyl.

8. A composition for the protection of cultivated plants against harmful effects of herbicides, which composition contains, as at least one active ingredient, an effective amount of a compound of the formula I according to claim 1.

4,505,739

HERBICIDAL 5-T-BUTYL-3-(N-ALKANOYLAMINO)PYRAZOLES

Nansho Seki; Yuki Yamaguchi; Yukihiro Nakamura; Hiroshi Kubo, and Tetsuo Tsuruya, all of Tokyo, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

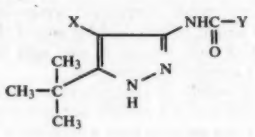
Filed Jan. 13, 1982, Ser. No. 368,232

Claims priority, application Japan, Apr. 13, 1981, 56-54321

Int. Cl.[3] **A01N** *43/56;* **C07D** *231/40*

U.S. Cl. 71—92 **16 Claims**

1. A pyrazole derivative represented by Formula I:

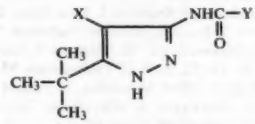


I

wherein X is a hydrogen atom and wherein Y is a straight or branched chain alkyl group having 1 to 10 carbon atoms, which may be substituted with halogen atoms or an alkoxy group; a straight or branched chain alkenyl group having 2 to 8 carbon atoms; a cycloalkyl group having 3 to 6 carbon atoms, which may be substituted with halogen atoms or lower alkyl groups; a phenyl lower alkyl group having 7 to 8 carbon atoms; or a

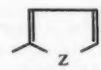
group wherein Z is an oxygen atom or a sulfur atom.

9. A herbicide composition represented by Formula I:



I

wherein X is a hydrogen atom and wherein Y is a straight or branched chain alkyl group having 1 to 10 carbon atoms, which may be substituted with halogen atoms or an alkoxy group; a straight or branched chain alkenyl group having 2 to 8 carbon atoms; a cycloalkyl group having 3 to 6 carbon atoms, which may be substituted with halogen atoms or lower alkyl groups; a phenyl lower alkyl group having 7 to 8 carbon atoms; or a



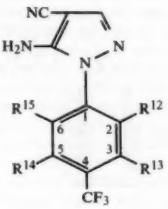
group wherein Z is an oxygen atom or a sulfur atom; and a carrier or diluent.

4,505,740
HERBICIDAL 5-AMINO-4-CYANO-1-PHENYL-PYRAZOLES

Leslie R. Hatton, Chelmsford; Edgar W. Parnell, Horndurch, and David A. Roberts, Bedford, all of England, assignors to May & Baker Limited, Essex, England

Filed Jul. 15, 1982, Ser. No. 398,336
Int. Cl.[3] A01N *43/56*; C07D *231/38*
U.S. Cl. 71—92 43 Claims

1. An N-phenylpyrazole derivative of the formula:



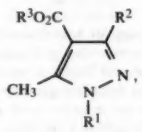
where R^{12} represents a chlorine atom and R^{13}, R^{14} and R^{15} each represent a hydrogen atom, or R^{12} and R^{15} each represent a chlorine atom and R^{13} and R^{14} each represent a hydrogen atom, or R^{12}, R^{13} and R^{15} each represent a chlorine atom and R^{14} represents a hydrogen atom, or R^{12}, R^{13}, R^{14} and R^{15} each represent a fluorine atom.

4,505,741
HERBICIDES CONTAINING-3-ARYL-5-METHYLPYRAZOLE-4-CARBOXYLIC ACID ESTERS, THEIR MANUFACTURE AND USE

Peter Plath, Ludwigshafen; Wolfgang Rohr, Wachenheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 150,751, May 19, 1980, abandoned.
This application Apr. 2, 1984, Ser. No. 595,968
Claims priority, application Fed. Rep. of Germany, May 23, 1979, 2920933
Int. Cl.[3] A01N *43/56*, *43/08*, *43/10*
U.S. Cl. 71—92 2 Claims

1. A process for combating the growth of unwanted plants, wherein the plants are treated with a herbicidally effective amount of a pyrazole derivative of the formula



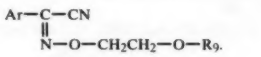
where R^1 denotes formyl, acetyl, propionyl, chloroacetyl, dichloroacetyl, methoxyacetyl, methoxycarbonyl, or phenoxycarbonyl which is unsubstituted or mono- or polysubstituted by halogen, R^2 denotes phenyl which is unsubstituted or mono- or polysubstituted by fluorine, chlorine, bromine, methyl, methoxy, cyano, trifluoromethyl, trifluoromethoxy or methoxycarbonyl, R^2 further denotes, an unsubstituted or methyl- or chlorosubstituted thienyl, furyl, oxazolyl or pyridyl, or R^2 denotes α-naphthyl or β-naphthyl, and R^3 denotes methyl, or a salt thereof.

4,505,742
OXIME DERIVATIVES FOR PROTECTING PLANT CROPS

Werner Föry, Basel; Henry Martin, Allschwil, both of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

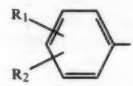
Division of Ser. No. 68,263, Aug. 20, 1979, Pat. No. 4,353,735.
This application Jul. 14, 1982, Ser. No. 398,171
Claims priority, application Switzerland, Aug. 31, 1978, 9201/78
Int. Cl.[3] A01N *25/32*
U.S. Cl. 71—93 10 Claims

1. A method of protecting sorghum, rice and wheat crops from the phytotoxic action of 1,3,5-triazine or haloacetanilide herbicides, which comprises adding to the herbicide or applying to the locus of the crops, as antidote, a compound of the formula



wherein

Ar is 1-naphthyl or



in which R_1 is hydrogen, halogen, lower alkyl or lower alkoxy, and R_2 is hydrogen or halogen, and R_9 is lower alkenyl,

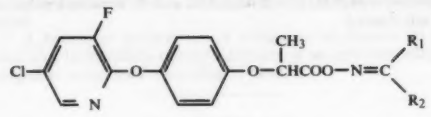
in a plant-protecting amount.

4,505,743
α-[4-(3-FLUORO-5'-HALOPYRIDYL-2'-OXY)-PHENOXY]-PROPIONIC ACID DERIVATIVES HAVING HERBICIDAL ACTIVITY

Rolf Schurter, Binningen, and Hermann Rempfler, Ettingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 20, 1982, Ser. No. 450,815
Claims priority, application Switzerland, Dec. 31, 1981, 8372/81
Int. Cl.[3] C07D *213/64*; A01N *43/40*
U.S. Cl. 71—94 4 Claims

1. A compound selected from the group consisting of a chlorofluoropyridine of the formula:



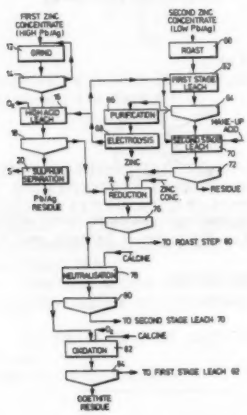
wherein each of R_1 and R_2 is alkyl of 1 to 4 carbon atoms.

4,505,744

RECOVERY OF ZINC FROM ZINC CONTAINING SULPHIDIC MATERIAL

Donald R. Weir; Ian M. Masters, and Gerald L. Bolton, all of Fort Saskatchewan, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Continuation-in-part of Ser. No. 282,576, Jul. 13, 1981, abandoned. This application Jun. 28, 1983, Ser. No. 508,699
Claims priority, application Canada, May 22, 1981, 378074
Int. Cl.[3] C22B *19/00;* **C01G** *5/00, 21/00;* **C01B** *17/02*
U.S. Cl. 75—120 **14 Claims**



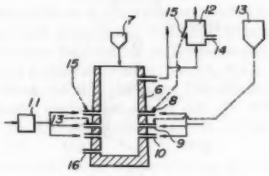
1. A process for recovering zinc from zinc containing sulphidic material which also contains iron and lead, the process comprising leaching the material under oxidizing conditions at a temperature in the range of from about 130° to about 155° C. in aqueous sulphuric acid solution with a stoichiometric excess of sulphuric acid relative to the zinc content of the material of from about 50 to about 100% to produce an undissolved residue containing a major proportion of the lead and a leach solution containing a major proportion of the zinc and iron, separating the sulphur and lead containing residue from the zinc and iron containing leach solution, physically separating elemental sulphur from the remaining lead-containing residue, recovering the remaining lead-containing reside, and treating the zinc and iron containing leach solution to recover zinc by feeding the solution to a conventional zinc recovery process which includes an iron-precipitating step.

4,505,745

METHODS OF PRODUCING AND USING AMORPHOUS MOTHER ALLOY

Takao Hamada; Nobuo Tsuchiya; Yo Ito; Toshihiro Inatani; Yoshiyasu Takada; Mitsuo Sumito, all of Chiba; Toshimitsu Koitabashi, and Hideshi Katayama, both of Ichihara, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Aug. 18, 1983, Ser. No. 524,444
Claims priority, application Japan, Aug. 27, 1982, 57-148787
Int. Cl.[3] C22C *33/00*
U.S. Cl. 75—129 **2 Claims**



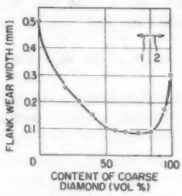
1. In a method of producing amorphous mother alloys by charging a mixture of raw material, carbonaceous reducing agent and secondary material into a furnace and smelting it to produce Fe-B-Si series molten metal having a B-Si composition range which lies within an area represented by the trapezoidal area abcd shown in FIG. **2** of the accompanying drawings, the improvement wherein B, Si and Fe contents contained in said mixture to be charged into said furnace are adjusted so as to satisfy $0.4 < B_2O_3/SiO_2 < 2.5$ and $0.08 < SiO_2/Fe_2O_3$ on a weight conversion of each oxide, and the resulting molten metal satisfies $\frac{1}{4} < Si/B < 1$ and $B + \frac{1}{3}Si > 30$ on atomic %.

4,505,746

DIAMOND FOR A TOOL AND A PROCESS FOR THE PRODUCTION OF THE SAME

Tetsuo Nakai, and Shuji Yazu, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 3, 1982, Ser. No. 414,821
Claims priority, application Japan, Sep. 4, 1981, 56-138644; Dec. 2, 1981, 56-192772; Jun. 2, 1982, 57-95104; Jul. 19, 1982, 57-124512
Int. Cl.[3] B22F *7/02;* **B24D** *3/02*
U.S. Cl. 75—243 **35 Claims**



1. A diamond compact for a tool, comprising 20 to 85% by volume of diamond grains with a grain size of at least 3 μm and the balance of a binder said binder consisting of (1) 20 to 95% by volume of ultra-fine diamond grains with a grain size of at most 1 μm, (2) at least one member with a grain size of at most 1 μm, selected from the group consisting of carbides, carbonitrides, nitrides, borides of Group 4*a*, 5*a* and 6*a* elements of Periodic Table, solid solutions thereof and mixed crystals thereof and (3) at least one member selected from the group consisting of iron group metals.

16. A process for the production of a diamond compact for a tool, comprising 20 to 85% by volume of diamond grains with a grain size of at least 3 μm and the balance of a binder said binder consisting of (1) 20 to 95% by volume of ultra-fine

diamond grains with a grain size of at most 1 μm, (2) at least one member with a grain size of at most 1 μm, selected from the group consisting of carbides, carbonitrides, nitrides, borides and Group 4*a*, 5*a* and 6*a* elements of Periodic Table, solutions thereof and mixed crystals thereof and (3) at least one member selected from the group consisting of iron group metals, which comprises preparing a mixture of diamond powder with a grain size of at least 3 μm, ultra-fine diamond powder with a grain size of at most 1 μm, at least one member with a grain size of at most 1 μm, selected from the group consisting of carbides, carbonitrides, nitrides, borides of Group 4*a*, 5*a* and 6*a* elements of Periodic Table, solid solutions thereof and mixed crystals thereof and at least one of iron group metal powders and subjecting the mixture to hot pressing at a high temperature and high pressure at which diamond is stable using an ultra-high pressure and high temperature apparatus.

27. A process for the production of a diamond compact tool, which comprises providing an intermediate layer consisting of a mixture of high pressure form boron nitride selected from the group of cubic type boron nitride and Wurtzite type boron nitride and at least one member selected from the group consisting of carbides, nitrides and carbonitrides of Group 4*a* and 5*a* elements of Periodic Table, solid solutions thereof and mixtures thereof on a substrate of WC-Co alloy or a cermet substrate of carbide crystals of (Mo, W)C type bonded by an iron group metal, charging on the intermediate layer mixed powders of 20 to 85% by volume of diamond grains with a grain size of at least 3 μm and the balance of a mixture of (1) 20 to 95% by volume of the mixture of ultra-fine diamond grains with a grain size of at most 1 μm, (2) at least one member with a grain size of at most 1 μm, selected from the group consisting of carbides, carbonitrides, nitrides, borides of Group 4*a*, 5*a* and 6*a* elements of Periodic Table, solid solutions thereof and mixed crystals thereof and (3) an iron group metal powder, hot pressing the assembly at a high temperature and high pressure at which diamond is stable using an ultra-high pressure and high temperature apparatus, and thereby sintering the diamond-containing hard layer powder and intermediate layer powder and simultaneously bonding to the substrate.

4,505,747

STABILIZING INOCULENT FOR GRAY IRON

William D. Glover, Northville, Mich., and Michael J. Lalich, Downington, Pa., assignors to Foote Mineral Company, Exton, Pa.

Continuation of Ser. No. 420,851, Sep. 21, 1982, abandoned. This application Dec. 16, 1983, Ser. No. 562,044

Int. Cl.[3] **B22F** *1/00;* **C22C** *33/08*

U.S. Cl. 75—251 **8 Claims**

1. An inoculant for gray iron comprising from about 50 to about 70 percent chromium, from about 1 to about 5 percent rare earths, the major portion of which is cerium, from about 5 to about 10 percent silicon, up to about 1 percent aluminum, up to about 1 percent calcium, up to about 5 percent carbon, and balance iron, said percentages being by weight, based on the total weight of the inoculant.

4,505,748

ANTI-CORROSIVE PAINT

Kenneth F. Baxter, Sunderland, England, assignor to International Paint, London, England

Filed May 31, 1983, Ser. No. 499,455

Claims priority, application United Kingdom, Nov. 10, 1982, 8232097

Int. Cl.[3] **C23F** *11/00;* **C04B** *31/02*

U.S. Cl. 106—14.39 **19 Claims**

1. An anti-corrosive coating composition for a metal substrate comprising a pigment component dispersed in a film-forming binder, in which the pigment component comprises (a) a salt comprising a polyvalent metal cation and an organic polyphosphonic acid containing at least two phosphonic acid groups and (b) a corrosion passivator capable of modifying the metal oxide film on the metal substrate to be protected to render it more protective, in which both the polyphosphonate salt (a) and the corrosion passivator (b) have a solubility of less than two grams per liter and the ratio of the polyphosphonate salt (a) to the passivator (b) is 1:1 to 50:1 by weight, and the film-forming binder is selected from a group consisting of alkyd resin, epoxy resin, oleoresin, chlorinated rubber, vinyl resin, polyurethane, polyester, organic silicate, inorganic silicate, polyamide and acrylic polymer.

4,505,749

METHOD OF FORMING COLOR IMAGES

Kazue Kanekiyo, Mitaka; Masatsune Kobayashi; Yasumasa Yokoyama, both of Yokohama; Tsuyoshi Eida, Ichikawa; Tomoko Komori, Machida, and Shoji Koike, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 507,580

Int. Cl.[3] **C09D** *11/02*

U.S. Cl. 106—20 **5 Claims**

1. A process for forming color images by overlap printing using more than one color ink selected from a plurality of color inks containing dyes, said plurality including black ink, wherein the dyes contained in said more than one color ink have similar chromatographic relative mobilities as measured by the Rf values.

4,505,750

FOUNDRY MOLD AND CORE SANDS

Jack C. Cowan, Lafayette, La., assignor to Venture Chemicals, Inc., Lafayette, La.

Filed Nov. 25, 1983, Ser. No. 555,175

Int. Cl.[3] **B28B** *7/34*

U.S. Cl. 106—38.35 **22 Claims**

1. A foundry mold or core sand composition comprising a major proportion of refractory sand, a binder, and from about 0.25% to about 4% by weight of said composition of hydrophobic, organophilic, water-wettable cotton fibers which have a particle size such that at least 90% by weight thereof will water wash through a 100 mesh screen.

4,505,751

PROCESS FOR UTILIZING A SILICATE/SILICA CEMENT IN OIL FIELD APPLICATIONS

Robert D. Sydansk, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Oct. 12, 1983, Ser. No. 541,194

Int. Cl.[3] **C04B** *19/04*

U.S. Cl. 106—84 **14 Claims**

1. A process for plugging void spaces in or adjoining a well bore with a silicate/silica cement comprising the steps of:

(a) admixing a substantially water-insoluble silica compound, which is at least somewhat more amorphous than quartz, in an aqueous solution containing a water-soluble silicate to produce a mixture comprised of about 0.1 to about 60 percent by weight of said silica compound, after 20 to about 99 percent by weight of said aqueous solution containing said water-soluble silicate and about 0 to about 80 percent by weight of an inert solid;

(b) injecting said mixture into said well bore so that said mixture penetrates said void spaces;

(c) curing said mixture at the formation temperature to form said silicate/silica cement in said void spaces wherein the set up time and strength of said cement are a function of the formation temperature, the concentration of said silica compound and water-soluble silicate in said reaction mixture, and the properties of said silica compound and water-soluble silicate; and

(d) plugging said void spaces with said silicate/silica cement.

4,505,752

FAST-SETTING CEMENTS FROM SOLID PHOSPHORUS PENTOXIDE CONTAINING MATERIALS

Fawzy G. Sherif, Stony Point, N.Y., and Edwin S. Michaels, Fairfield, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 11, 1983, Ser. No. 522,074
Int. Cl.³ C04B 9/04
U.S. Cl. 106—85 51 Claims

1. A dry blend capable of forming a fast-setting cement when reacted with an aqueous component comprising:

(a) a solid phosphorus pentoxide containing waste reactive component; and

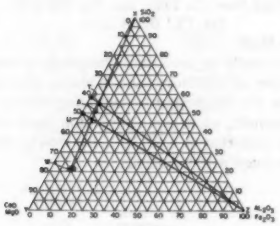
(b) a solid component comprising a magnesium containing compound, said solid component capable of being dry blended with said phosphorus pentoxide component without reacting therewith and further capable of reacting with said phosphorus pentoxide component in the presence of said aqueous component to form a monolithic solid.

4,505,753

CEMENTITIOUS COMPOSITE MATERIAL

Barry Scheetz, Lamont, Pa.; Janine M. Rizer, Waldorf, Md., and Michael Hahn, MPI-Eisenforschung, Fed. Rep. of Germany, assignors to Research One Limited Partnership, Towson, Md.

Filed Jun. 30, 1983, Ser. No. 509,685
Int. Cl.³ C04B 7/35
U.S. Cl. 106—90 8 Claims



1. A mixture for producing a cementitious composite material exhibiting a combination of high tensile, flexural and compressive strengths as compared with generally accepted values for Class H cements, in which said mixture comprises:

a. between 40 and 60% by weight of Portland cement,

b. between 5 and 20% by weight of pozzolanic amorphous silica known as condensed silica fume,

c. between 1 and 3% by weight of a superplasticizer,

d. between 13 and 18% by weight of water,

e. up to 0.5% by weight of antifoam agent; and

f. up to 40% by weight of "chemically inactive" particles of finely divided crystalline silica filler material.

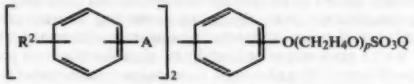
4,505,754

PROCESS FOR FOAM LOWERING AND IMPROVEMENT OF ALUM SENSITIVITY OF DISPERSED SIZE

John W. Gowan, Jr., Mt. Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Sep. 19, 1983, Ser. No. 533,432
Int. Cl.³ C08L 93/04
U.S. Cl. 106—238 8 Claims

1. An improved process for modifying the surface of paper to control liquid penetration comprising the interaction of a rosin-based material and alum upon a pulp furnish wherein the aqueous dispersion of a rosin-based material is prepared by mixing together (1) a melt of the rosin-base material, (2) a surfactant selected from the group consisting of at least one salt of sulfuric acid half ester represented by the formula



wherein R^2 is hydrogen or lower alkyl, A is straight-chain or branched-chain alkylene having 2 to 3 carbon atoms, p is an integer of 4 to 25, and Q is a monovalent cation, and (3) water to obtain a dispersion comprising a continuous phase of the rosin-base material and a dispersed phase of the water, and adding water to the dispersion to invert the dispersion to the contemplated aqueous dispersion comprising a dispersed phase of the rosin-base material and a continuous phase of the water, wherein the improvement comprises the step of adding a cosurfactant consisting of dioctyl sodium sulfosuccinate, said cosurfactant being added in an amount sufficient to lower the foaming tendency of the aqueous dispersion and increase the sensitivity of the rosin-base material to the alum.

4,505,755

METHOD OF PRODUCING SURFACE-TREATED BARIUM SULFATE

Kiyoshi Shinozuka; Koichi Otu, and Hiroshi Fukumoto, all of Iwaki, Japan, assignors to Onahama Sakai Kagaku Kabushiki Kaisha, Japan

Filed Apr. 20, 1983, Ser. No. 486,962
Claims priority, application Japan, Dec. 28, 1982, 57-229842; Dec. 28, 1982, 57-229843
Int. Cl.³ C01G 23/06; C08G 41/02
U.S. Cl. 106—308 B 12 Claims

1. A method of producing surface-treated barium sulfate which comprises:

adding an aqueous solution of an alkali silicate to an aqueous feed slurry of barium sulfate which contains barium ions in excess, the alkali silicate being added in amounts of 0.1–30% by weight in terms of silica based on the weight of barium sulfate in the slurry, to deposit barium silicate on the surface of barium sulfate in the slurry,

and then adding a meneral acid to the resultant slurry and adjusting it at a pH not greater than about 7 to decompose the barium silicate to hydrous silica.

4,505,756

ALPHA-AMYLASE ASSAY AND SUBSTRATES FOR USE THEREIN

Paul T. Nix, Jackson; Rebecca D. Goldfarb, Howell; Linda J. Stong, Hightstown; Lorraine E. Sulick, Short Hills; Ramesh C. Trivedi, Freehold, and Stanley W. Morgenstern, Neptune, all of N.J., assignors to CooperBiomedical, Inc., Palo Alto, Calif.

Division of Ser. No. 165,035, Jul. 1, 1980, Pat. No. 4,304,854, Continuation-in-part of Ser. No. 80,672, Oct. 1, 1979, abandoned, which is a continuation of Ser. No. 912,986, Jun. 6, 1978, abandoned. This application Sep. 1, 1981, Ser. No. 298,380
Int. Cl.³ C12Q 1/40, 1/26; C12P 19/18; C13F 3/00
U.S. Cl. 127—29 5 Claims

1. A method of making MDP limit dextrin which comprises incubating beta-amylase and a carbohydrate selected from the group consisting of starch and glycogen and mixtures thereof in an aqueous medium at a temperature suitable for beta-amylase incubation under conditions and for a time suitable to produce a beta-amylase limit dextrin, followed by further incubating the beta-amylase limit dextrin with malto-dextrin phosphorylase in the presence of inorganic phosphate at a temperature suitable for phosphorylase incubation under conditions and for a time suitable to produce a MDP limit dextrin, destroying said beta-amylase and said phosphorylase after said

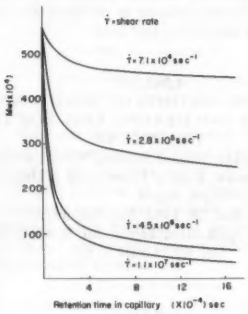
incubations therewith by heating said aqueous medium and isolating said MDP limit dextrin.

4,505,757

METHOD FOR A SPECIFIC DEPOLYMERIZATION OF A POLYSACCHARIDE HAVING A ROD-LIKE HELICAL CONFORMATION

Takemasa Kojima, Yokohama; Kengo Tabata; Toshio Yanaki, both of Kobe, and Mitsuaki Mitani, Sagamihara, all of Japan, assignors to Kaken Pharmaceutical Co. Ltd. and Taito Co., Ltd., both of Tokyo, Japan

Filed Jan. 24, 1983, Ser. No. 460,300
Claims priority, application Japan, Feb. 16, 1982, 57-237241
Int. Cl.³ C13K *13/00*
U.S. Cl. 127—36 **9 Claims**



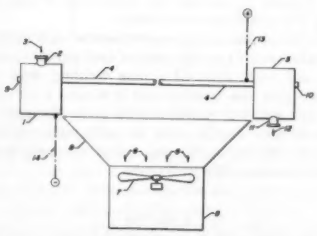
1. A process for depolymerization of a polysaccharide having a rod-like structure, comprising a step for forcing a solution of about 0.1–10 wt. % of polysaccharide in a solvent (solvent A) through a capillary at a shear rate higher than 1×10^4 Sec^{-1}, to produce a lower molecular weight degraded polysaccharide, which has the same repeating unit and the same helical structure, as those of the original polysaccharide.

4,505,758

HEAT EXCHANGER DEPOSIT REMOVAL

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 10, 1983, Ser. No. 502,903
Int. Cl.³ B08B *7/04, 9/02*
U.S. Cl. 134—1 **1 Claim**



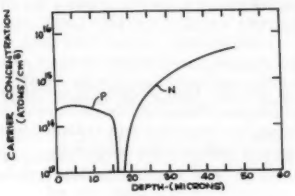
1. In a method for cleaning indirect heat exchanger tubes while said tubes are in continuous use to cool a liquid emanating from a hydrocarbon reaction zone by passing said liquid through the tubes in indirect heat exchange relationship to a relatively cooler gaseous stream, wherein said hydrocarbon reaction zone liquid deposits particles on the inside of said heat exchanger tubes, the improvement which consists of intermittently applying for a short period of time an electric current to at least a portion of said heat exchanger tubes to heat said portion to a temperature sufficient to soften said deposited particles on the inside of the so heated tubes while simultaneously passing said hydrocarbon reaction zone liquid continuously therethrough to physically remove said softened deposits.

4,505,759

METHOD FOR MAKING A CONDUCTIVE SILICON SUBSTRATE BY HEAT TREATMENT OF OXYGENATED AND LIGHTLY DOPED SILICON SINGLE CRYSTALS

William C. O'Mara, 111 Main St., Los Altos, Calif. 94022

Filed Dec. 19, 1983, Ser. No. 562,845
Int. Cl.³ H01L *21/225, 7/54*
U.S. Cl. 148—1.5 **14 Claims**



1. A method for making a conductive substrate for semiconductor devices comprising,

(a) forming an oxygenated, doped single-crystal silicon wafer substrate, having opposite major surfaces and having semiconductor electrical conductivity,

(b) heating the substrate at a temperature between 1,000°–1,150° C. to deplete the substrate surfaces of oxygen,

(c) fabricating semiconductor devices on one of the substrate surfaces by planar processing, and then

(d) heating the substrate to a temperature of about 450° C. until the bulk of the substrate between the surfaces becomes highly conductive.

4,505,760

PROCESS FOR PARTIAL HOT DIPPING OF STEEL STRIPS

Masahiko Itoh, Hitachiota; Heihatiro Midorikawa, Hitachi; Akira Minato, Hitachi; Mituru Kubo, Hitachi; Takehiko Ito, Sakai, and Kiichiro Katayama, Funabashi, all of Japan, assignors to Hitachi, Ltd. and Nisshin Steel Co., Ltd., both of Tokyo, Japan

Filed Dec. 16, 1982, Ser. No. 450,449
Claims priority, application Japan, Dec. 23, 1981, 56-206986
Int. Cl.³ C23C *1/10*
U.S. Cl. 148—6.15 R **8 Claims**

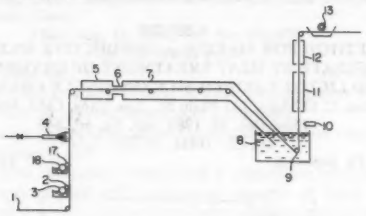
1. A continuous and high speed process for the partial hot dipping of a long steel strip, which comprises the successive steps of:

(a) forming an oxidation-inhibiting film, oxygen-impermeable and thermally stable in a hot-dipping molten metal bath, which is produced by chemical reaction of the iron in the steel strip with an oxidation-inhibiting-film forming agent, on a predetermined area of the steel strip surface,

(b) forming a thermally stable inorganic binder on the oxidation-inhibiting film, said binder comprising an aqueous solution of water glass or borax which contains metal

oxide or clay powder thermally stable in a hot-dipping molten metal bath,

(c) forming a carbon-containing, plating-stopping film as a top coat over the oxidation-inhibiting film and the inorganic binder, and



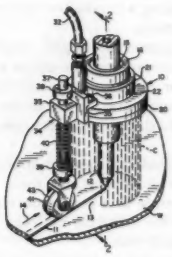
(d) dipping the steel strip having the oxidation-inhibiting film, the inorganic binder, and the plating-stopping film, in a hot-dipping molten metal bath to form a metal coating on an exposed surface of the metal strip.

4,505,761

METHOD AND APPARATUS FOR QUENCHING A TORCH-CUT WORK-PIECE

Paul W. Schmidt, Portland, Oreg., assignor to ESCO Corporation, Portland, Oreg.

Filed May 9, 1984, Ser. No. 608,375
Int. Cl.³ B23K *7/02*
U.S. Cl. 148—9 R **14 Claims**



1. A method for quenching a torch-cut work-piece comprising moving a cutting torch relative to a work-piece to be cut and directing an enveloping curtain of water about said torch for impingement upon said work-piece except against the portion of the work-piece just cut.

4,505,762

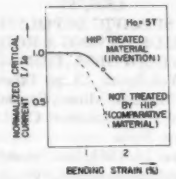
METHOD OF PRODUCING COMPOUND-TYPE SUPERCONDUCTING WIRES

Toshiro Fukutsuka, Kobe; Masato Moritoki, Miki; Takao Fujikawa, Kobe, and Norio Gennai, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 24, 1981, Ser. No. 276,984
Claims priority, application Japan, Jun. 27, 1980, 55-88053
Int. Cl.³ H01L *39/00*
U.S. Cl. 148—11.5 R **3 Claims**

1. A method of producing compound-type superconducting wires having an improved ratio of critical current at applied stress, I_c, to critical current at zero stress, I_o, which comprises the steps of:

(i) subjecting a wire made of metallic materials, capable of reacting together, upon heating, to form a compound having superconducting characteristics, to a heat treatment sufficient to form a compound-type wire having superconducting characteristics, and



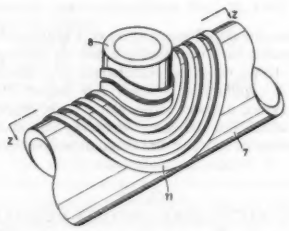
(ii) holding said superconducting wire thus formed under sufficient temperature to cause plastic deformation of said wire and sufficient pressure to collapse the voids in said wire, thereby densifying said wire.

4,505,763

HEAT-TREATING METHOD OF WELD PORTION OF PIPING SYSTEM AND HEATING COIL FOR THE HEAT TREATMENT

Isao Sugihara, Hitachi; Wataru Sagawa, Mito; Tsukasa Ikegami, and Tasuku Shimizu, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 23, 1982, Ser. No. 391,305
Claims priority, application Japan, Jul. 8, 1981, 56-105534
Int. Cl.³ C21D *1/30*
U.S. Cl. 148—127 **21 Claims**



1. A method of heat-treating a weld zone of a piping system, in which the outer wall of a pipe is heated by means of a heating coil, while a coolant is present in said pipe, to establish a temperature difference between the inner and outer walls of said pipe thereby to prevent the weld zone of said pipe from corroding and cracking due to stress,

wherein the improvement resides in that said heating coil is wound on both a parent pipe of said piping system and at least one weld zone of a pipe welding desk in such a manner that said heating coil is wound over said parent pipe and said pipe welding desk generally concentrically with respect to the axis of said pipe welding desk, whereby the parent pipe and at least one weld zone can be heated, substantially uniformly.

4,505,764

MICROSTRUCTURAL REFINEMENT OF CAST TITANIUM

Robert J. Smickley, Whitehall, and Louis E. Dardi, Muskegon, both of Mich., assignors to Howmet Turbine Components Corporation, Greenwich, Conn.

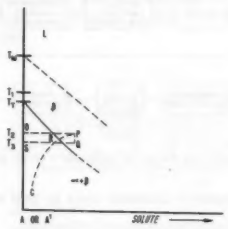
Filed Mar. 8, 1983, Ser. No. 473,676
Int. Cl.³ C22F *1/18*
U.S. Cl. 148—133 **15 Claims**

1. A method of treating a metal casting comprised of titanium, said method comprising the steps of:

heating said casting to a treatment temperature in the range

of from 800° F. to 2000° F., said treatment temperature being below the beta transus temperature for said metal;

diffusing hydrogen into said metal casting at said treatment temperature such that hydrogen is present in said metal in an amount in the range of from 0.2% to 5% by weight, said hydrogen thereby inducing the transformation of (HCP) alpha in said casting to (BCC) beta;



removing said hydrogen at an average rate greater than 0.01%/hour to transform said beta to alpha at a rate sufficient to refine the microstructure of the alpha formed from beta upon removal of said hydrogen; and

throughout said method maintaining the temperature of said metal casting, when hydrogen is present in more than trace amounts, above the temperature at which metal hydrides would be formed.

4,505,765

MANUFACTURING METHOD FOR A PLANAR PHOTODIODE WITH HETERO-STRUCTURE

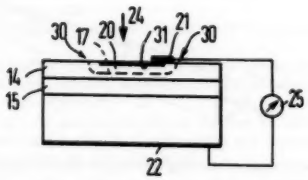
Reiner Trommer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,349

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227263

Int. Cl.³ H01L *31/06*

U.S. Cl. 148—171 **6 Claims**



1. In a method for manufacturing a planar photodiode wherein a plurality of layers of semiconductor material are epitaxially deposited on one another, and wherein a hetero junction arises between a layer provided with a pn junction and a layer adjacent thereto, wherein the improvement comprises the steps of: epitaxially depositing a first layer and then a second layer on a substrate body, a semiconductor material of the second layer being a material having a background doping value such that a pn junction with an avalanche effect is subsequently generatable in the second layer, a material of the first layer being selectively etchable relative to the material of the second layer, a material of the substrate body being selectively etchable relative to the material of the first layer, and a diffusion coefficient of a dopant for the second layer being at least not significantly higher for the material of the first layer than for the material of the second layer; epitaxially growing a third layer on the second layer, said third layer comprising a material having as high as possible an absorption of radiation for which the photodiode is being designed; epitaxially depositing a further semiconductor material for a carrier body on the third layer; selectively etching away the substrate body; by photolithography, selectively etching a corresponding mask opening in the first layer for subsequent generation of the pn junction in the second layer; introducing a dopant into the second layer through said mask opening so as to create the pn junction in the second layer; removing a residue of the first layer by means of selective etching so that thereafter the pn junction lies exclusively in the second layer; and applying respective contacts to where said dopant was introduced into the second layer and at the carrier body.

4,505,766

METHOD OF FABRICATING A SEMICONDUCTOR DEVICE UTILIZING SIMULTANEOUS OUTDIFFUSION AND EPITAXIAL DEPOSITION

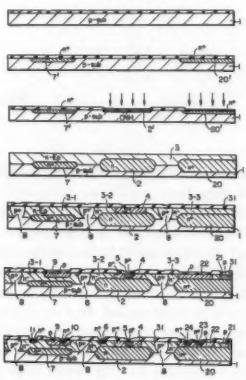
Shuzo Nagumo, Koganei; Setsuo Ogura, Kodaira, and Yukinori Kitamura, Mitaka, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Division of Ser. No. 210,813, Nov. 26, 1980, abandoned. This application May 4, 1983, Ser. No. 491,543

Claims priority, application Japan, Nov. 28, 1979, 54-152925

Int. Cl.³ H01L *21/20, 21/74*

U.S. Cl. 148—175 **6 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of

preparing a semiconductor substrate of a first conductivity type;

introducing at least one impurity of a second conductivity type into predetermined portions of a surface of said substrate spaced apart from each other, so that respective predetermined portions may have unequal impurity concentrations;

forming a semiconductor layer of said second conductivity type on said surface of said substrate with said at least one impurity of said second conductivity type being introduced therein, and causing said at least one impurity of said second conductivity type to be diffused into said semiconductor layer, to thereby form a first semiconductor buried layer and a second semiconductor buried layer of said second conductivity type, which second semiconductor buried layer has an impurity concentration higher than that of said first semiconductor buried layer;

forming a first semiconductor region of said first conductivity type which extends from a part of a surface of said semiconductor layer between said first semiconductor buried layer and said second semiconductor buried layer down to a part of said substrate between said first semiconductor buried layer and said second semiconductor

buried layer, and simultaneously forming a second semiconductor region of said first conductivity type which extends from a part of the surface of said semiconductor layer overlying said first semiconductor buried layer and which connects to said first semiconductor buried layer;

forming a third semiconductor region of said first conductivity type in a part of the surface of said semiconductor layer overlying said second semiconductor buried layer, and

forming a fourth semiconductor region of said second conductivity type in a surface of said third semiconductor region.

4,505,767

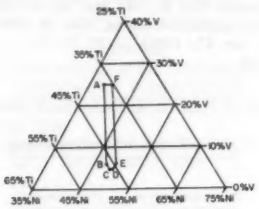
NICKEL/TITANIUM/VANADIUM SHAPE MEMORY ALLOY

Mary P. Quin, Redwood City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 14, 1983, Ser. No. 541,844

Int. Cl.[3] **C22C** *19/00, 30/00*

U.S. Cl. 148—402 **8 Claims**



1. A shape memory alloy consisting essentially of nickel, titanium, and vanadium within an area defined on a nickel, titanium, and vanadium ternary composition diagram by a hexagon with its first vertex at 38.0 atomic percent nickel, 37.0 atomic percent titanium, and 25.0 atomic percent vanadium; its second vertex at 47.6 atomic percent nickel, 46.4 atomic percent titanium, and 6.0 atomic percent vanadium; its third vertex at 49.0 atomic percent nickel, 46.4 atomic percent titanium, and 4.6 atomic percent vanadium; its fourth vertex at 49.8 atomic percent nickel, 45.6 atomic percent titanium, and 4.6 atomic percent vanadium; its fifth vertex at 49.8 atomic percent nickel, 44.0 atomic percent titanium, and 6.2 atomic percent vanadium; and its sixth vertex at 39.8 atomic percent nickel, 35.2 atomic percent titanium, and 25.0 atomic percent vanadium.

4,505,768

METHOD OF MAKING A DECORATIVE HEAT RESISTANT LAMINATE

James Cooley, Orangeburg, S.C., assignor to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 601,663, Apr. 18, 1984, abandoned, which is a division of Ser. No. 544,774, Oct. 4, 1983,. This application Jul. 18, 1984, Ser. No. 632,058

Int. Cl.[3] **B32B** *31/12*

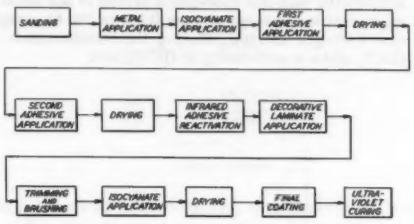
U.S. Cl. 156—153 **8 Claims**

1. A method for forming a heat resistant decorative laminate comprising the steps of:

providing a wood substrate having at least one planar surface;

applying a discontinuous layer of molten metal with a plasma arc spray apparatus onto the planar surface of said wood substrate to cover more than 50% but less than 100% of said surface;

applying 1.0 to 5.0 mils wet of an isocyanate solution over the discontinuous metal layer, with the isocyanate solution penetrating into the discontinuities in said metal layer and contacting the wood substrate at said discontinuities;



applying at least one layer of adhesive over said isocyanate layer; and

applying a decorative laminate layer to said adhesive.

4,505,769

METHOD AND APPARATUS FOR MAKING A WRAPPER SLEEVE

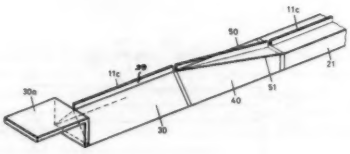
Robert Auckenthaler, Schaffhausen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jan. 9, 1984, Ser. No. 569,029

Claims priority, application Switzerland, Jan. 18, 1983, 271/83

Int. Cl.[3] **B31B** *1/52, 1/26;* **B29D** *23/10*

U.S. Cl. 156—217 **12 Claims**



1. A method of making a wrapper sleeve from a film length comprising the following consecutive steps:

(a) wrapping the film length about a sealing mandrel such that opposite longitudinal edge zones of the film length are in a face-to-face oriented relationship; said sealing mandrel having a circumferential length, a cross-sectional shape and a longitudinal sealing edge formed by two intersecting sides of the sealing mandrel; said wrapping step comprising the step of placing the opposite longitudinal edge zones in said face-to-face oriented relationship immediately beyond said sealing edge;

(b) providing a sealing seam in and along the face-to-face oriented longitudinal edge zones for bonding said edge zones to one another whereby a wrapper sleeve is formed; and

(c) removing the wrapper sleeve from said sealing mandrel and inserting said wrapper sleeve on a forming mandrel having a circumferential length identical to that of said sealing mandrel and a cross-sectional shape different from that of said sealing mandrel.

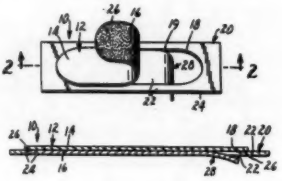
4,505,770
PERIPHERALLY SUPPORTED PACKAGE FOR ADHESIVE-SURFACED ARTICLES

Franklin C. Larimore, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 292,008, Aug. 11, 1981, Pat. No. 4,394,904, which is a continuation-in-part of Ser. No. 224,446, Jan. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 203,566, Nov. 5, 1980, abandoned. This application Apr. 27, 1983, Ser. No. 489,259

Int. Cl.[3] **B44C** *1/16;* **B32B** *31/00, 3/10;* **A61F** *13/02*

U.S. Cl. 156—235 **6 Claims**



1. A method of applying a delicate, sheet-like, adhesive-surfaced article from a package to an adherend, said package providing facile placement of said article onto an adherend without distortion and surface contamination of said surface, said package consisting essentially of

(a) an adhesive-surfaced, delicate sheet-like article;

(b) a release sheet laminated to the adhesive surface of said article and cut to form

(1) a peripheral release carrier that is releasably adhered to peripheral areas of said adhesive surface and that has a central aperture exposing a major portion of the adhesive surface of said article; and

(2) a release cover cut out of said release sheet and having exact dimensions of said aperture in said peripheral release carrier, releasably adhered over the portion of said adhesive surface exposed by said aperture;

the ratio of the length of a straight line joining any two points on the perimeter of said article and passing through the center of said article, to a summation of segments of that line overlapped by said peripheral release carrier, being at least about 5 to 1; said method comprising the steps of:

(a) removing the release cover from said article to expose said adhesive surface;

(b) positioning said article with release cover removed on an adherend;

(c) adhering said adhesive surface of said article by application of pressure, solvent, moisture, or heat to adhere said article to said adherend;

(d) removing said peripheral release carrier by pulling it away from the periphery of said article and leaving said article in position on said adherend;

and

(e) adhering the adhesive surface of said periphery of said article to said adherend by application of pressure, solvent, moisture, or heat to said article.

4,505,771
ARRANGEMENT, APPARATUS, AND METHOD TO FORM LAMINATES, AND THE LIKE SUCH AS COPPER CLAD

David W. George, New Castle, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Jun. 9, 1982, Ser. No. 386,504

Int. Cl.[3] **B32B** *31/20*

U.S. Cl. 156—285 **36 Claims**

16. An apparatus for picking up a film-like material, such as a thin copper sheet from a copper sheet pick-up station, transporting it, and depositing it into a build-up station having a supporting surface, to form at least an uncured laminate unit in a build-up area and wherein because of the thinness and lightness of the copper sheet there is a tendency for objectionable air pockets to become entrapped under said copper sheet when deposited, comprising:

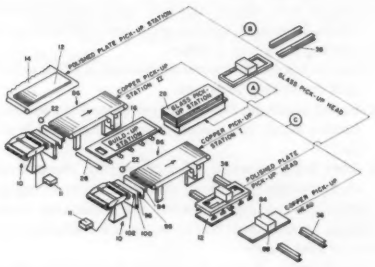
a sheet carrying means constructed and arranged to travel above and to and from said copper pick-up and build-up stations, including:

a member having a length and a width approximately equal to that of said sheet and having a surface positionable adjacent to said copper sheet,

integral chamber means in said member arranged to communicate with said positionable surface for receiving negative air pressure in a manner to cause said sheet to adhere to said surface for a copper sheet pick-up mode and for receiving positive air pressure in a manner to cause said sheet to be forced away from said surface for a copper sheet depositing mode, and

means for selectively delivering said negative and positive pressures into said chamber means,

said pressure selective means including means for controlling the application of said positive pressure in a manner that said copper sheet is deposited by forcing a first portion thereof against said supporting surface of said build-up station, and thereafter by forcing the remaining portions of said copper sheet against said supporting surface



so that any entrapped air is progressively forced away from said first portion to the edge of said copper sheet from where the air will escape.

25. In a method for stacking uncured copper clad laminate units in a build-up area of a laminating press line, each unit consisting of a metal plate, a glass sheet, and at least one sheet of film-like material, such as a copper sheet, and wherein a copper sheet head is used to pick up, transport, and deposit a copper sheet into a build-up station, the steps comprising:

uncoiling a predetermined length of copper sheet from a copper let-off unit into a copper sheet pick-up station where said copper sheet head is positionable adjacent to said copper sheet and above said copper sheet station.

supplying negative air pressure into said head so that said copper sheet is picked-up by said head in a manner that the center line of said head corresponds to that of said copper sheet,

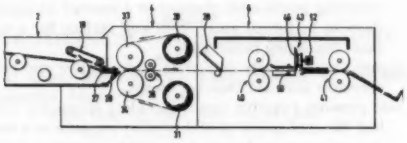
motivating said copper sheet head transversely to position said head directly above said build-up station, and

supplying positive air pressure into said head so that said copper sheet is deposited onto said build-up station in a manner that the center line of said copper sheet correponds to that of said stacked laminate units, and free from the entrapment of air between said copper sheet and said laminate units.

4,505,772
APPARATUS FOR LAMINATING SHEETS WITH A PLASTIC FILM

Peter Renz, Unterm Stein 9, 7072 Heubach-Lautern, Fed. Rep. of Germany

Filed May 3, 1983, Ser. No. 491,230
Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3216970
Int. Cl.[3] B26D *5/00*; B32B *31/00, 31/04*; B65H *7/08*
U.S. Cl. 156—355 7 Claims

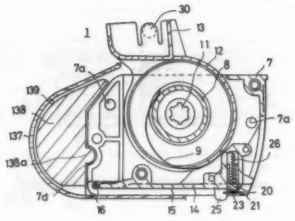


1. An apparatus for laminating sheets, comprising:
an intermittently running sheet feeder for feeding sheets to be laminated, said sheet feeder including:
a sheet storage area;
means for defining a feeder conveying path for conveying sheets from said storage area, said conveying path including a waiting position,
a first photoelectric barrier positioned at a first point along said conveying path, and
a second photoelectric barrier positioned at a second point further along said conveying path than said first point, and
a sheet feeder conveyor for conveying sheets from said sheet storage area along said feeder conveying path;
a continuous running laminator for laminating sheets fed thereto by said sheet feeder to form a continuous lamination of said sheets;
an intermittently running cross cutter for cutting said continuous lamination into separate laminated sheets, said cross cutter including:
means for conveying the continuous lamination and separate laminated sheets along a cutter conveying path,
a cutter blade positioned at a predetermined point along said cutter conveying path,
a control device for operating said cutting blade, and
a first timer having a first time delay, coupled to said first and second photoelectric barriers, arranged such that when a trailing edge of a first sheet from said sheet storage area clears said first photoelectric barrier, it begins to time and when it times out, it causes said sheet feeder conveyor to run, thereby advancing a second sheet from said storage area, a leading edge of said second sheet breaking said first photoelectric barrier causing said sheet feeder conveyor to stop conveying thereby bringing said second sheet to rest at said waiting position, and
a second timer having a second time delay, coupled to said second photoelectric barrier, arranged such that when the trailing edge of said first sheet clears said second barrier, it begins to time and when it times out it causes said sheet feeder conveyor to run, thereby advancing said second sheet from said waiting position to said laminator,
the first timer being further arranged such that when a leading edge of the second sheet breaks the second barrier, said first timer begins to time and when it times out, said sheet feeder conveyor is caused to stop conveying at which time said second sheet is at said laminator.

4,505,773
AUTOMATIC LABEL WINDING AND CHARGING DEVICE

Yo Sato, Tokyo; Tadao Kashiwaba, Iwate; Yasuhiko Matsuda, Iwate, and Tadahisa Oikawa, Iwate, all of Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Mar. 1, 1984, Ser. No. 585,280
Claims priority, application Japan, Mar. 3, 1983, 58-32913
Int. Cl.[3] B65C *9/46, 11/00*
U.S. Cl. 156—384 28 Claims



1. A portable label applying system including:
a printer for printing indicia on a plurality of labels adhered in a longitudinal series to a web of backing paper to form a printed label web;
a cassette for receiving a printed label web printed by said printer, said cassette being adapted for mounting to a label applicator for dispensing printed labels from said cassette and applying them to commodities; and
an automatic label winding and charging means comprising:
cassette mounting means disposed in said printer for operatively mounting said cassette in said printer to receive a printed label web,
guide means disposed adjacent to said cassette mounting means for directing a printed label web into said cassette,
winding means disposed in said cassette for winding a printing label web being fed from said printer, and
peel preventing means for cooperating with said guide means for preventing labels from being peeled from a printed label web being received by said cassette, said guide means comprising a curved guide member having an inwardly curved side for guiding said printed label web, said peel preventing means comprising a peel preventing member having a curved side facing said inwardly curved side and profiled to define an arcuate guide groove between said curved guide member and said peel preventing member.

4,505,774
INSTRUMENT PANEL MANUFACTURING SYSTEM

Yoshio Ariga; Yoshiki Ishige; Shogi Satoh; Masao Tegawa; Toshiyuki Kinugasa, and Toru Yamamoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,259
Claims priority, application Japan, Jun. 4, 1982, 57-95808; Jun. 7, 1982, 57-84174[U]; Jun. 7, 1982, 57-84175[U]; Jun. 10, 1982, 57-86504[U]; Jun. 15, 1982, 57-102662; Jun. 15, 1982, 57-89386[U]
Int. Cl.[3] B32B *35/00*
U.S. Cl. 156—499 17 Claims

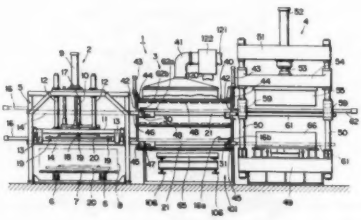
1. An instrument panel manufacturing system comprising:
means for feeding a unit sheet;
means for heating said sheet;
means for pressing said heated sheet against a core member having adhesive coated on a surface thereof and for forming it thereon;
first rails being included in said feeding means and being movable up and down between a raised position and a

lowered position, and substantially extending in a lateral direction;

upper rails and lower rails arranged in said heating means at each of the locations corresponding to said raised position and said lowered positions, respectively;

heater means arranged along the upper side and lower side of said upper rails;

auxiliary rams in said forming means which are movable up and down between a first position and a second position,



each of which positions corresponds to said upper rails and said lower rails of said heating means, respectively;

second rails fixed to said auxiliary rams;

a bogie which can be run on said first rails, said upper rails, said lower rails and said second rails and removably holds said unit sheet;

said bogie being provided with clamp means for removably holding said unit sheet by clamping the end thereof; and

a driving means for advancing and retracting said bogie.

4,505,775

METHOD FOR PREPARATION OF CATIONIC CELLULOSE

Margot J. Harding; Robert C. Gaines, both of Federal Way, and Jerome M. Gess, Bellevue, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Jun. 24, 1983, Ser. No. 507,366

Int. Cl.³ D21C *9/00*

U.S. Cl. 162—9 **12 Claims**

1. A method of making a cationic bleached cellulose product which comprises adding to an alkaline stage of a fiber bleaching sequence at least 0.5 kg/t based on the dry weight of the cellulose present of a cationizing agent selected from the group consisting of crosslinked and uncrosslinked condensates of epichlorohydrin and dimethylamine, and mixtures thereof wherein the crosslinking agent, if present, is selected from the group consisting of ammonia and a primary aliphatic diamine of the type $H_2N—R—NH_2$ where R is an alkylene radical of from 2 to 8 carbon atoms.

4,505,776

COMPOSITION AND METHOD FOR TREATING FLUE GAS AND METHANOL CONTAINING EFFLUENTS

Francis E. Murray, Richmond, Canada, assignor to Wescam Services Inc., Vancouver, Canada

Filed Jul. 8, 1982, Ser. No. 396,442

Int. Cl.³ C01B *17/64;* **D21C** *11/08*

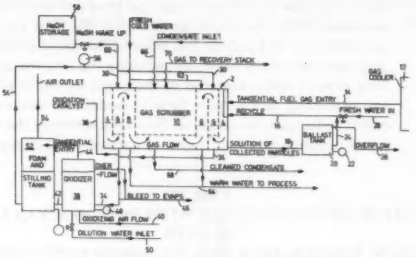
U.S. Cl. 162—51 **31 Claims**

24. A method of purifying flue gas and condensates from a kraft pulp mill comprising:

(a) first scrubbing the flue gas with water to remove particulates;

(b) scrubbing the effluent gases from step (a) with an aqueous alkaline solution of a metal salt and black liquor to absorb hydrogen sulfide the metal salt being selected from the group consisting of iron, chromium, cobalt, and nickel salts, with the concentration of black liquor being 1 to 10% by volume, and the amount of metal salt and black liquor in solution being sufficient to synergistically increase absorption of hydrogen sulfide by the alkaline solution;

(c) scrubbing the effluent gas from step (b) with water, to recover heat;



(d) scrubbing the condensates with the effluent gas from step (c).

4,505,777

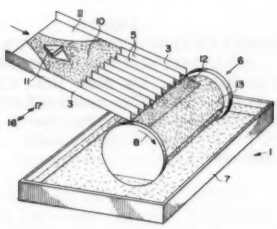
METHOD FOR PRODUCING ORIENTED FLEECES OR MATS OF SHORT LENGTH FIBERS

Heinz Richter, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 202,176, Oct. 29, 1980, abandoned. This application Jun. 18, 1982, Ser. No. 389,614

Int. Cl.³ D21F *1/06;* **D21H** *5/12*

U.S. Cl. 162—102 **5 Claims**



1. A method for producing fiber fleeces or mats of fibers having a relatively short length, said short length fibers being held in a suspension of said short length fibers in a suspension liquid in a container, by flowing the suspension through a chute in a flow direction from the container onto an air permeable film on a rotatable screen drum, comprising the following steps:

(a) causing a reduced pressure inside said screen drum,

(b) subdividing by partitions at least a length portion of the chute across the entire chute width into a plurality of narrow flow channels having a given flow width between adjacent partitions extending in parallel to one another in the flow direction,

(c) selecting the sidth of each narrow flow channel in a direction across the flow direction to be sufficiently small relative to said short fiber length so that the individual short fibers are exposed, due to wall friction, to flow speed components extending across the flow direction in each narrow flow channel, so that the maximum flow speed is reached in each narrow flow channel substantially in the center between two adjacent partitions, and so that the minimum flow speed is reached in each flow channel substantially next to the partitions, for longitudinally aligning the individual short fibers substantially in parallel to one another in the flow direction in each narrow flow channel prior to any curing, said longitudinal aligning of

said short fibers resulting in a substantially smaller curing pressure required in a subsequent curing step and yielding improved strength characteristics of the finished fleece or mat,

(d) rotating the screen drum at a circumferential speed which is equal to or larger than the flow out speed of the suspension from the chute, accelerating the flow through an outlet end of the chute just prior to flowing the suspension onto the screen drum, by reducing the cross-sectional flow area of said outlet end of the chute by baffle plates, and extending said narrow flow channels into said outlet end of reduced cross-sectional flow area whereby the flow speed is increased in each of said narrow flow channels.

4,505,778

PAPER PRODUCTS SIZED WITH POLYISOCYANATE BLENDS

John R. Robertson, Glenn Mills, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Filed Sep. 6, 1983, Ser. No. 529,597

Int. Cl.[3] **D21H** *1/10*

U.S. Cl. 162—135 **11 Claims**

1. A paper composition comprising cellulosic fibers having chemically bonded polyisocyanate sizing resins consisting essentially of a blend of an aromatic polyisocyanate resin containing from 1–10 percent by weight of an isocyanate terminated prepolymer having the formula $RO(CH_2CHR'O)_n$-CONHX wherein R is selected from an alkyl group containing 1 to 4 carbon atoms and a polyester condensation product of a diacid and a polyether glycol, R′ is selected from H or CH_3, n is an integer ranging from 5 to 120 and X is a residue of an aromatic di or polyisocyanate and which contains at least one free isocyanate group.

4,505,779

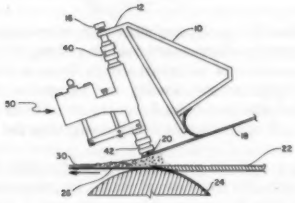
METHOD OF MODIFYING A PAPER MACHINE HEADBOX SLICE ROD ASSEMBLY

Mathew G. Boissevain, Los Altos Hills, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Sep. 13, 1982, Ser. No. 417,827

Int. Cl.[3] **D21F** *1/06*

U.S. Cl. 162—199 **4 Claims**



4. A process for modifying a paper machine headbox manually-adjustable slice rod assembly including a screw jack, to permit the assembly to be operated by a fluid actuator in combination with the screw jack and without modifying the structure which supports the assembly, wherein the manually-adjustable slice rod assembly includes a coupler connecting the assembly to a slice lip, the process comprising:

(a) removing a section of a slice rod assembly between two points on the assembly between the screw jack and the coupler while leaving the screw jack in place coupled to the support structures;

(b) inserting a fluid actuator in the position previously occupied by the section of the rod which was removed; and

(c) rigidly coupling the fluid actuator to the sections of the rod which were not removed.

4,505,780

JOINING WEATHERSTRIPPINGS

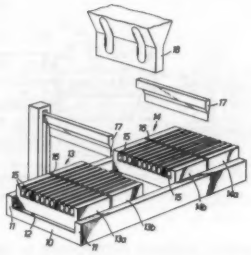
George R. Sewards, Barton, England, assignor to Linear Limited, Durham, England

Filed Jul. 5, 1983, Ser. No. 510,823

Claims priority, application United Kingdom, May 27, 1983, 8314841

Int. Cl.[3] **B29C** *27/06, 27/08;* **B65H** *69/08*

U.S. Cl. 156—507 **3 Claims**



1. A jig for joining weatherstrippings formed by a strip which has upper and lower surfaces, which is woven from an artifical yarn and which carries a plurality of side-by-side but spaced rows of pile on the upper surface thereof, the jig comprising:

a slideway,

two holders slidable in the slideway,

a plurality of parallel but spaced pile-receiving guide slots extending along the holders for receiving the side-by-side but spaced rows of pile respective weatherstrippings, the guide slots of one holder being aligned with the guide slots of the other holder,

each holder being formed in two parts, one holder part being closer to the other holder than the other holder part,

each said closer holder part being removable from the slideway,

each said other holder part being slidable in the slideway, after removal of said closer holder parts, until said other holder parts abut one another,

a tap provided between the parts of each holder, heated knife means,

a fusing device arranged between the holders to fuse a strip of heat fusible material across the butted cut ends of the two weatherstrippings held in alignment in said other holder parts, with the pile rows arranged in the guide slots, the cut ends being formed prior to fusing by said heated knife means cutting the weatherstrippings at said gaps, the cut end portions in the closer holder parts then being removed with said closer holder parts, and the other holder parts being slid together to abut the cut ends of the weatherstrippings for said fusing together.

4,505,781

METHOD OF REDUCING LIGHT REFLECTION FROM GLASS SURFACES

Daniel Cozac, Braine l'Alleud, and Hugo Rogghe, Mol, both of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Aug. 17, 1982, Ser. No. 408,741

Claims priority, application United Kingdom, Aug. 20, 1981, 8125538

Int. Cl.[3] **C03C** *15/00;* **B41C** *1/00*

U.S. Cl. 156—640 **16 Claims**

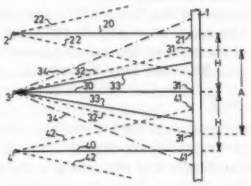
1. A method of modifying the light reflecting properties of a glass surface with the use of a bank of nozzles which spray etching solution on the glass surface, said method comprising:

arranging the bank of nozzles to form a single row of nozzles;

moving the bank of nozzles and glass surface relatively past

one another, with the single row of nozzles being aligned transverse to the direction of relative movement; and

causing the nozzles, during said moving step, to deliver synchronously oscillating divergent spray streams each in the form of a fine mist spray cone which impacts the glass surface in a respective impact zone so that in any one cycle of oscillation the impact zones of the spray cones on



the glass surface together cover a continuous band-like impact region extending in a direction across the glass surface transversely of the direction of the relative movement, with the impact zone of each respective spray cone covering only a portion of the continuous band-like impact region in a direction of the region across the glass surface transversely of the direction of relative movement.

4,505,782

PLASMA REACTIVE ION ETCHING OF ALUMINUM AND ALUMINUM ALLOYS

Adir Jacob, and Daniel H. Chöe, both of Framingham, Mass., assignors to LFE Corporation, Clinton, Mass.

Continuation of Ser. No. 478,845, Mar. 25, 1983, abandoned. This application Sep. 26, 1983, Ser. No. 535,929

Int. Cl.[3] **C23F** *1/02;* **C03C** *15/00, 25/06;* **B44C** *1/22*

U.S. Cl. 156—643 **8 Claims**

1. A process for selective reactive ion etching of thin films of aluminum and aluminum alloys in the presence of an etch mask, within a reaction chamber, comprising the step of:

exposing said aluminum metallization within the chamber to a gas plasma for etching, wherein said gas plasma consists essentially of a quaternary mixture of boron trichloride (BCl_3) as a major constituent and chlorine (Cl_2), silicon tetrafluoride (SiF_4), and oxygen (O_2) as the minor constituents, wherein said BCl_3 constitutes 40 to 65% by volume of the mixture, Cl_2 constitutes 15 to 30% by volume, SiF_4 constitutes 10–25% by volume, and O_2 constitutes 2 to 5% by volume of the mixture.

4,505,783

OXYGEN CONCENTRATION DETECTOR AND METHOD OF USING SAME

Syunzo Mase, Ama, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed May 20, 1982, Ser. No. 380,282

Claims priority, application Japan, May 25, 1981, 56/77923

The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

Int. Cl.[3] **G01N** *27/46*

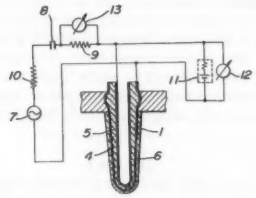
U.S. Cl. 204—1 T **21 Claims**

1. An oxygen concentration detector for detecting the oxygen concentration in gases, comprising:

an oxygen ion conductive solid electrolyte body;

a plurality of separate electrodes contacting the solid electrolyte body, at least two of said plurality of separate electrodes having the solid electrolyte body therebetween, thereby forming an oxygen concentration cell for detecting oxygen partial pressure in a gas;

AC power supplying means connected to at least two of said plurality of separate electrodes having the solid elctrolyte body therebetween, for applying an AC voltage across said solid electrolyte body through said electrodes, said AC power supplying means being arranged to supply an AC voltage at a frequency sufficiently high such that an impedance between said electrodes to which AC voltage is applied is largely independent of interface capacitances between said electrodes to which AC voltage is applied and a surface where said separate electrodes contact said solid electrolyte body;



means for simultaneously applying a DC current across said electrodes, said DC current regulating the oxygen concentration in gases; and

electromotive force detecting means connected to at least two of said plurality of separate electrodes having the solid electrolyte body therebetween, for detecting an electromotive force of the oxygen concentration cell.

4,505,784

METHOD FOR UREA ANALYSIS

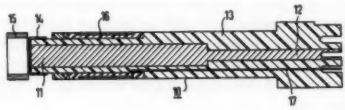
Konrad Mund, Uttenreuth; Günter Luft, Lauf, and Ulrich Gebhardt, Langensendelbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,246

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1981, 3129988

Int. Cl.[3] **G01N** *27/46*

U.S. Cl. 204—1 T **9 Claims**



1. A method for determining the urea concentration in liquids comprising:

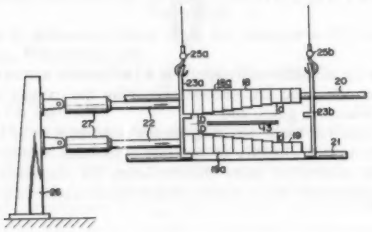
impressing on an electrode separated by a diaphragm permeable to urea, from the urea containing liquid, potentionstatically and cylically two potential values, the more positive potential being in the interval 0.9 $V \leqq \phi/H_2 rev \leqq 2.0$ V and the more negative potential being lower than 0.6 V/H rev, and evaluating the current flowing within a predetermined time interval during the more positive potential as the measuring signal

wherein the diffusion coefficient of said diaphragm for urea is lower than 10^{-7} cm^2/s and said diaphragm possesses both hydrophobic and hydrophilic properties such that the degree of hydrophilization of the diaphragm is within the interval $1:15 \geqq H \geqq 1:100$.

4,505,785
METHOD FOR ELECTROPLATING STEEL STRIP

Hiroshi Miwa, Tokyo; Toshio Kaneko, Yokohama; Akira Tonouchi, Tokyo, and Tatsuro Anan, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1982, Ser. No. 349,681
Claims priority, application Japan, Feb. 24, 1981, 56-25920
Int. Cl.[3] C25D 7/06
U.S. Cl. 204—28 11 Claims



1. A method of electroplating movable steel strips of different widths by arranging a plurality of electrode rows in an electrolytic cell containing an electrolytic solution, each of said electrode rows having a first end and a second end and comprising a plurality of metal electrodes disposed adjacent to each other along the direction of the width of said steel strips in opposed relationship to the direction of travel of said steel strips, the width of said electrode rows being greater than the width of said steel strips, and conducting an electrical current through the electrolytic solution in an amount sufficient to electroplate the metal of said metal electrodes on a steel strip having a first width and subsequently electroplating the metal of said metal electrodes on a steel strip having a second width different from said first width, and while electroplating said steel strips of different widths:

intermittently or continuously advancing said metal electrodes of said electrode rows in the same direction, said direction being perpendicular to the direction of travel of said steel strips and said advancing being at a speed whereat the distribution of the amount of the metal of said electrodes which is electroplated in the direction of the width of said steel strips is kept within an allowable tolerance; and

transferring one of said metal electrodes from the first end of one of said advance electrode rows to the second end of one of said advanced electrode rows;

said speed v (m/hr) of advancing said electrodes of said electrode rows satisfying the relation:

$$v \geq [60 \cdot E \cdot D_A \cdot W(100-2A)]/(20 \cdot A \cdot \rho \cdot K \cdot D/)$$

wherein ρ is the density of the electroplated metal (g/cm^3); K is the electroplating constant of the metal (A·min/g); D is the distance between the steel strip being plated and the second end of said electrode row (mm); A is the allowable tolerance of the electroplated amount in the direction of the width of the steel strip being plated (%); E is the electrolytic efficiency; D_A is the current density (A/dm^2); and W is the width of the steel strip being plated (m).

4,505,786
PRETREATMENT OF PLASTIC MATERIALS FOR METAL PLATING

Albert A. Birkmaier, Mendham; Gary A. Harpell, Morristown, both of N.J.; Bruce E. Kurtz, Marcellus, N.Y.; Gordhanbhai N. Patel, Camillus, N.Y.; Rustom P. Poncha, Syracuse, N.Y.; Adam L. Skovrinski, Memphis, N.Y., and James M. Lesco, Anaheim Hills, Calif., assignors to Allied Corporation, Morris Township, Morris County, N.J.

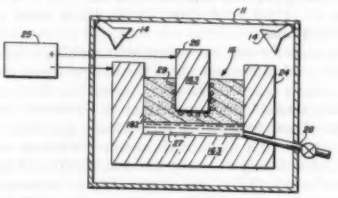
Continuation-in-part of Ser. No. 335,773, Dec. 30, 1981, Pat. No. 4,422,907. This application Aug. 8, 1983, Ser. No. 520,193
The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.
Int. Cl.[3] C25D 5/56
U.S. Cl. 204—38.4 27 Claims

1. In an improved process for metal plating a natural or synthetic plastic material by conditioning said material to improve metal adhesion and depositing a metal coating upon said conditioned surface from an electroless plating bath, wherein said improvement comprises a conditioning step in which said material is exposed to an atmosphere comprising an effective amount of ozone and is then contacted with an effective amount of a conditioning solvent.

4,505,787
PROCESS FOR PRODUCTION OF A CARBIDE BY-PRODUCT WITH MICROWAVE ENERGY AND ALUMINUM BY ELECTROLYSIS

Tom E. Fuller, Phoenix, and Lewis R. Finell, Scottsdale, both of Ariz., assignors to Super Fuel Systems Incorporated, Phoenix, Ariz.

Filed Jul. 13, 1981, Ser. No. 282,938
Int. Cl.[3] C25C 3/06, 7/06; B01J 19/12
U.S. Cl. 204—67 37 Claims



27. A method for conserving energy required to raise the temperature of two or more reactants to a sufficient temperature to cause said reactants to react chemically to produce at least one desired reaction by-product, comprising the steps of:

injecting two or more reactant materials into a reaction vessel, this step further comprising the step of injecting carbon and an element of at least one of a metal, and boron and silicon in at least one of its elemental, and oxide and hydride forms to produce a carbide by-product;

radiating said two or more reactants with electromagnetic energy other than heat waves to raise the temperature of at least one of said two or more reactants to a sufficient temperature to elevate the temperature of all said reactants sufficiently to cause said reactants to react chemically to produce a carbide by-product;

inhibiting radiation of electromagnetic energy while removing the reaction by-product from the reaction vessel; and

generating a gaseous fuel from a reaction by-product for use in providing supplementary energy requirements of practicing said method.

30. A method for conserving energy required to raise the temperature of two or more reactants, one or more of which reactants is non-susceptible to heating by electromagnetic radiation other than heat waves, to a sufficient temperature to cause said reactants to react chemically to produce at least one desired reaction by-product, comprising the steps of:

injecting two or more reactant materials into a reaction

vessel; wherein the injecting two or more reactant materials into a reaction vessel comprises the steps of injecting carbon, alumina and cryolite, forming said carbon to provide a fluid retaining vessel and an electrolysis electrode pair within said reaction vessel; radiating said two or more reactants with electromagnetic energy other than heat waves to raise the temperature of at least a selected one of said two or more reactants to a sufficient temperature to cause said at least said selected one of said reactants to conduct heat to all of said reactants so as to thereby elevate the temperature of all said reactants sufficiently to cause said reactants to react chemically to produce a desired reaction by-product; and inhibiting radiation of electromagnetic energy while removing the reaction by-product from the reaction vessel.

31. The method of claim 30 further comprising the step of subjecting said temperature elevated reactants to an electrolysis action to produce aluminum and carbon dioxide by-products.

4,505,788

PRODUCTION OF P-AMINOBENZOYLGLUTAMIC ACID BY ELECTROCHEMICAL REDUCTION

Kokichi Yoshida; Takao Niinobe, both of Hikari, and Takashi Baba, Kumage, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed May 31, 1984, Ser. No. 615,527
Claims priority, application Japan, May 31, 1983, 58-97377
Int. Cl.³ C25B *3/00*
U.S. Cl. 204—74 **6 Claims**

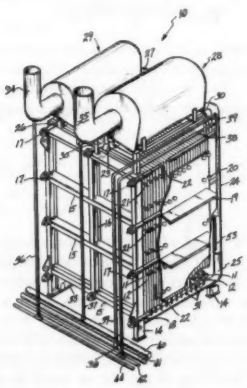
1. A method of producing p-aminobenzoylglutamic acid which comprises electrochemically reducing p-nitrobenzoylglutamic acid and/or p-hydroxyaminobenzoylglutamic acid using a cathode of a palladium metal or palladium alloy in an aqueous solution at a pH value of 3 or less.

4,505,789

DYNAMIC GAS DISENGAGING APPARATUS AND METHOD FOR GAS SEPARATION FROM ELECTROLYTE FLUID

James M. Ford, Cleveland, Tenn., assignor to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 334,943, Dec. 28, 1981, abandoned. This application Dec. 14, 1983, Ser. No. 561,427
Int. Cl.³ C25B *1/08, 1/26, 15/08, 9/00*
U.S. Cl. 204—128 **15 Claims**



15. A method of separating product gas from an electrolyte fluid comprising the steps of:

(a) introducing the electrolyte fluid into generally horizontally positioned disengaging means along a generally vertical predetermined path of flow that is tangential to the arcuate internal periphery of the disengaging means;

(b) causing the electrolyte fluid to travel about the arcuate internal periphery using the centrifugal force of the electrolyte fluid to separate out the product gas so that the liquid phase of the electrolyte fluid remains adjacent the arcuate internal periphery of the disengaging means;

(c) removing the separated product gas in a generally horizontal flow path from the disengaging means by having the product gas enter a generally horizontally positioned gas stationary discharge means connected to and at least partially within the disengaging means; and

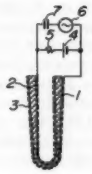
(d) draining any liquid phase of the electrolyte fluid within the discharge means through at least one bottom opening prior to the liquid phase leaving the disengaging means.

4,505,790

OXYGEN CONCENTRATION REGULATION

Syunzo Mase, Aichi, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed May 20, 1982, Ser. No. 380,140
Claims priority, application Japan, May 25, 1981, 56-77921
The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—130 **19 Claims**



15. A method of regulating oxygen concentration in a gaseous environment using an electrolysis cell comprising the steps of:

providing at least one electrolysis cell having at least two separate electrodes contacting an oxygen ion conductive solid electrolyte body and having the solid electrolyte body therebetween, at least one of said electrodes being exposed to gas in a gaseous environment;

heating the solid electrolyte body by applying an AC voltage across at least two separate electrodes having the solid electrolyte body therebetween, and thereby decreasing the impedance of said cell, and

flowing the DC current across the electrodes which comprises the electrolysis cell when said solid electrolyte body is in its heated condition, said DC current regulating the oxygen concentration around at least one of said electrodes.

4,505,791

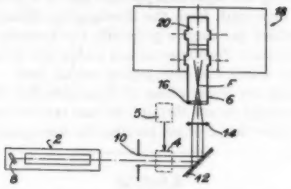
ISOTOPIC SEPARATION PROCESS

Christian Angelié , Orsay; Michel Cauchetier, Rambouillet, and Jacques Paris, Bures sur Yvette, all of France, assignors to Commissariat a l'Energie Atomigue, Paris, France

Filed Aug. 17, 1982, Ser. No. 408,945
Claims priority, application France, Aug. 28, 1981, 81 16423
Int. Cl.³ B01D *59/00*
U.S. Cl. 204—157.1 R **9 Claims**

1. A process for the isotopic separation in a cell of a compound X having at least two isotopic forms, wherein the molecules of compound X are excited in the gaseous state, so as to bring about their dissociation, by means of a vibrational energy transfer between the molecules of compound X and the excited molecules of a compound A, in the gaseous state and having a

dissociation energy higher than that of compound X, the densities of compounds X and A being below about 2×10^{17} molecules /cm^3, the vibrational transfer kinetics being different up to the dissociation of the molecules of compound X for the at least two isotopic forms to be separated under temperature conditions such that the thermal width of the vibrational energy levels involved in the vibrational energy transfer is at the



most equal to the isotopic shift between the resonance energy levels of the at least two isotopic forms to be separated, and wherein the molecules of compound A are excited by an absorption of light emitted by a pulsed laser source, the duration, energy of the light pulses and irradiated section being such that the absorption time of the light by the molecules of the compound A is less than the excitation time of the molecules of compound X up to their dissociation.

4,505,792

PHOTOCHEMICAL REARRANGEMENT OF 2-AMINOPYRROLIN-5-ONES TO AMINOCYCLOPROPYL ISOCYANATES AND POLYMERS THEREOF

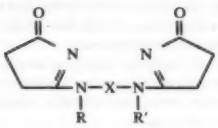
Tad H. Koch, and Barry J. Swanson, both of Boulder County, Colo., assignors to University Patents, Inc., Westport, Conn.

Division of Ser. No. 240,043, Mar. 3, 1981, Pat. No. 4,380,647. This application Sep. 22, 1982, Ser. No. 421,611

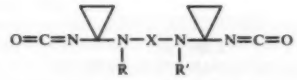
Int. Cl.^{3} **C08G** *18/80;* **C07C** *118/00*

U.S. Cl. 204—159.11 **7 Claims**

1. A process for the photochemical rearrangement of bis-(2-aminopyrrolin-5-ones) to bis-(aminocyclopropyl isocyanates) comprising the step of subjecting the bis-(2-aminopyrrolin-5-one) to ultraviolet irradiation, said bis-(2-aminopyrrolin-5-one) being characterized by the structure

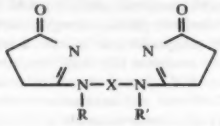


and said bis-(aminocyclopropyl isocyanate) being characterized by the structure



where R and R′ are hydrocarbyl substituents containing from 1 to about 12 carbon atoms and are selected from the class consisting of alkyl, aryl, alkaryl, and aralkyl groups, and X is a substantially rigid bridging unit selected from the group consisting of 1,4-substituted butyne-2, 1,4-substituted trans-butene-2, bis-methyl substituted m-xylene, bis-methyl substituted p-xylene, and hydrocarbyl substituted derivatives thereof containing from 1 to about 12 carbon atoms.

7. In a process for the preparation of polyurethane or polyurea polymeric products by the reaction of substantially equimolar amounts of (a) a diisocyanate and (b) a glycol or diamine, respectively, the improvement comprising the steps of (1) replacing from about 2 to about 10 mol % of the diisocyanate ingredient with a bis-(2-amino-pyrrolin-5-one) characterized by the structure



where R and R′ are hydrocarbyl substituents containing from 1 to about 12 carbon atoms and are selected from the class consisting of alkyl, aryl, alkaryl, and aralkyl groups, and X is a substantially rigid bridging unit selected from the group consisting of 1,4-substituted butyne-2, 1,4-substituted trans-butene-2, bis-methyl substituted m-xylenes, and bis-methyl substituted p-xylenes, and (2) thereafter subjecting the diisocyanate ingredient of the reaction mixture to ultraviolet irradiation both prior to and during the otherwise conventional polymerization step.

4,505,793

PHOTOPOLYMERIZABLE COMPOSITIONS

Koji Tamoto; Akira Umehara; Teruo Nagano; Masayuki Iwasaki, and Yoshimasa Aotani, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 20, 1982, Ser. No. 400,200

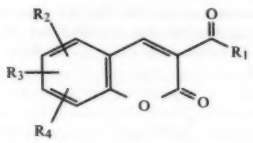
Claims priority, application Japan, Jul. 20, 1981, 56-11317

Int. Cl.^{3} **C08F** *2/50*

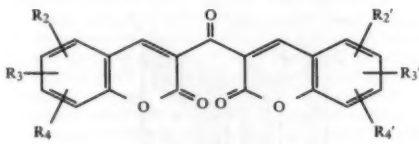
U.S. Cl. 204—159.16 **7 Claims**

1. A photopolymerizable composition comprising a polymerizable compound containing at least one ethylenically unsaturated double bond and a photopolymerization initiator wherein the photopolymerization initiator is a combination of a 3-keto-substituted cumarin compound and an active halogeno compound, and

wherein the 3-keto-substituted cumarin compound is at least one member selected from the compounds represented by the general formula (I) or (I′):



(I)



(I′)

wherein R_1 is (1) an alkyl group containing from 1 to 10 carbon atoms, (2) a substituted or unsubstituted aryl group containing from 6 to 12 carbon atoms, where the substituent for the substituted aryl group R_1 is a dialkylamino group with the alkyl moiety containing from 1 to 4 carbon atoms, a diarylamino group with the aryl moiety containing from 6 to 10 carbon atoms, an alkoxy group containing from 1 to 4 carbon atoms, or an alkyl group containing from 1 to 4 carbon atoms, or (3) a $-CH{=}CH)_nR_5$ group wherein R_5 is (a) a substituted or unsubstituted aryl group containing from 6 to 14 carbon atoms where the substituent for the substituted aryl group R_5 is a dialkylamino group with the alkyl moiety containing from 1 to 4 carbon

atoms, a diarylamino group with the aryl moiety containing from 6 to 10 carbon atoms, an alkoxy group containing from 1 to 4 carbon atoms, or an alkyl group containing from 1 to 4 carbon atoms, or (b) a heterocyclic group in which the number of carbon atoms and hetero atoms constituting the ring is from 5 to 15; and n is 1 or 2; and R_2, R_3, R_4, R_2', R_3', and R_4' are each hydrogen, an alkoxy group containing from 1 to 6 carbon atoms, an alkyl group containing from 1 to 4 carbon atoms, a dialkylamino group with the alkyl moiety containing from 1 to 4 carbon atoms, a hydroxy group, a halogen atom, a nitro group, or a 5-membered or 6-membered heterocyclic group, and two or three of R_2, R_3 and R_4 or R_2', R_3' and R_4' may combine together to form a condensed ring, or a condensed heterocyclic ring in which the number of carbon atoms and hetero atoms constituting the ring is from 5 to 10, and

wherein the active halogeno compound is at least one member selected from the group consisting of aromatic sulfonyl chloride compounds and s-triazine compounds substituted by at least one trihalomethyl group.

4,505,794

THIOXANTHONECARBOXYLIC ACID ESTERS, THIOESTERS AND AMIDES

Vratislav Kvita, Muttenz; Hans Zweifel, Basel; Martin Roth, Marly, and Louis Felder, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

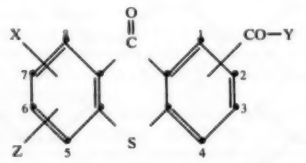
Division of Ser. No. 392,922, Jun. 28, 1982, , which is a continuation of Ser. No. 150,391, May 16, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 422,111

Claims priority, application Switzerland, May 18, 1979, 4671/79

Int. Cl.³ C08F *2/50*

U.S. Cl. 204—159.24 **9 Claims**

1. A photopolymerizable composition comprising (A) at least one ethylenically unsaturated compound and (B) as an initiator for the photopolymerization of (A), a mixture comprising a compound corresponding to the formula I



(I)

in which X is hydrogen; Z is hydrogen, halogen, —OH, —SH or alkyl, alkoxy, alkylthio or dialkylamino having 1–4 C atoms in the alkyl moieties; Y is $—OR_1$, or $—N(R_1)(R_2)$; R_1 is alkyl having 1–24 C atoms, alkoxyalkyl having 3–10 C atoms, C_5–C_8-cycloalkyl, phenyl, naphthyl, $—(CH_2)_m—$phenyl or $—(CH_2CH_2O)_n—CH_3$; R_2 is hydrogen or a R_1 radical; m is the number 1 or 2; and n is an integer from 2 to 10, the group —CO—Y being bonded in the 1-position or 3-position; and an organic amine.

4,505,795

PLASMA METHOD AND APPARATUS FOR THE PRODUCTION OF COMPOUNDS FROM GAS MIXTURES, PARTICULARLY USEFUL FOR THE PRODUCTION OF NITRIC OXIDES FROM ATMOSPHERIC AIR

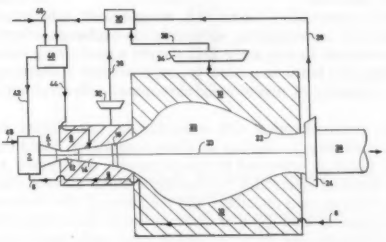
Moshe Alamaro, 73 Herzl St., Hod Hasharon, Israel

Continuation of Ser. No. 325,731, Nov. 30, 1981, abandoned. This application Nov. 10, 1983, Ser. No. 550,516

Claims priority, application Norway, Dec. 3, 1980, 803666

Int. Cl.³ C01B *21/30*

U.S. Cl. 204—179 **22 Claims**



1. A process for the formation of compounds from a gaseous medium by the plasma method, in which an electrical discharge is effected in a reactor into which the gaseous medium is fed such as to cause a chemical reaction, characterized in that the gas flow is at supersonic speed within said reactor, and at least part of the energy of the gaseous medium exiting from the reactor is converted into electrical energy.

5. The process according to claim 1, wherein gaseous medium fed into the reactor includes a mixture of nitrogen gas and oxygen gas, and the formed compound is nitric oxides.

4,505,796

ELECTROLYTIC REDUCTION CELLS

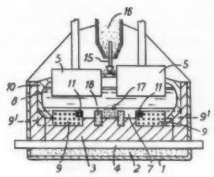
Jean-Paul R. Huni; Ethan A. Hollingshead; Thomas G. Edgeworth; Raman R. Sood; Ernest W. Dewing, all of Kingston, Canada, and Charles J. Rogers, Whitebridge, Australia, assignors to Alcan International Limited, Montreal, Canada

Filed Jun. 23, 1982, Ser. No. 391,406

Claims priority, application United Kingdom, Jun. 25, 1981, 8119590

Int. Cl.³ C25C *3/00, 3/06*

U.S. Cl. 204—243 R **5 Claims**



1. In an electrolytic reduction cell for the production of molten metal by electrolysis of a molten electrolyte, which is less dense than the product metal, said cell comprising one or more anodes suspended above a floor structure, on which is located a body of molten product metal constituting the cathode of the cell, and a generally rectangular shell having side and end walls for containing the molten contents of the cell, the improvement which consists in at least one essentially linear baffle member extending transversely of the cell and having energy-absorbing restricted flow channels formed therein, said baffle member extending upwardly from the cell

floor to a position close to the level of molten metal in the cell, the flow channels of said baffle member comprising a series of flow restricting apertures formed in said baffle member.

4,505,797

ION-EXCHANGE MEMBRANES REINFORCED WITH NON-WOVEN CARBON FIBERS

Russell B. Hodgdon, Sudbury, and Warren A. Waite, Burlington, both of Mass., assignors to Ionics, Incorporated, Watertown, Mass.

Filed Mar. 24, 1983, Ser. No. 478,603
Int. Cl.³ C25B *9/00*; C08D *5/20*
U.S. Cl. 204—252 **5 Claims**

1. An electrically conductive, cross-linked substantially hydraulically impermeable, polymeric ion-exchange selective resin membrane having embedded therein a reinforcing matrix or backing of a fabric structure; the improvement comprising a fabric consisting of non-woven, carbonized polyacrylonitrile fibers.

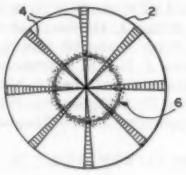
5. An electrochemical cell apparatus for transferring ions from one solution to another solution comprising liquid containing chambers separated by ion-permeable membranes and having terminal electrodes for passing a direct current transversely through said chambers and membranes, the improvement wherein at least some of said membranes have imbedded therein a reinforcing fabric of non-woven, carbonized polyacrylonitrile fibers.

4,505,798

MAGNETRON SPUTTERING APPARATUS

Kovilvila Ramachandran, Ottawa, and Enrico Giani, Orleans, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 17, 1983, Ser. No. 552,810
Claims priority, application Canada, Nov. 18, 1982, 415872
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **6 Claims**



1. In a magnetron sputtering apparatus, including a chamber, a support for a cathode target, a magnet to provide an endless magnetic track whereby sputtering is concentrated in a closed band, and a composite conductive cathode target comprising adjacent integral sector areas of different material to permit the simultaneous sputtering of said different material in an alloy ratio determined by the relative area thereof.

4,505,799

ISFET SENSOR AND METHOD OF MANUFACTURE

Ronald D. Baxter, Furlong, Pa., assignor to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 559,513, Dec. 8, 1983, abandoned. This application Jul. 16, 1984, Ser. No. 631,507
Int. Cl.³ H01L *21/60*; G01N *27/30*
U.S. Cl. 204—416 **14 Claims**

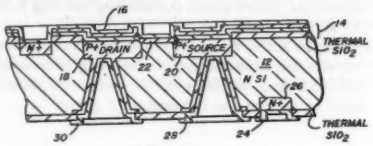
12. In an ISFET having a silicon substrate with a crystal orientation of (100) which is doped to an opposite conductivity type from said substrate to provide source and drain regions, an external electrical source and drain contact structure, comprising:

individual holes etched by an orientation dependent etch from the back of said ISFET to the source and drain regions and terminating at the boundary of said source and drain regions;

regions in the sidewalls of said holes doped to an opposite conductivity type from that of said substrate to provide electrical isolation of the surface of said sidewalls from said substrate; and

a metallized surface deposited on the sidewalls of the holes and extending from the source and drain regions to separate associated contact areas on the back of said ISFET.

13. A method of providing electrical contact to a source region and drain region of an ISFET having a silicon substrate with a crystallographic orientation of (100), comprising the steps of:



providing an etch stopping characteristic in the source and drain regions;

etching with an orientation dependent etch individual holes from the back of the substrate to the source and drain regions to provide access to the source and drain regions, said etch being stopped at the boundary of said source and drain regions by said etch stopping characteristic;

producing an isolation region in the sidewalls of said holes of opposite conductivity type to the substrate; and

metallizing over said sidewalls and onto the back to provide the electrical contacts for said source and drain regions on the back of said ISFET.

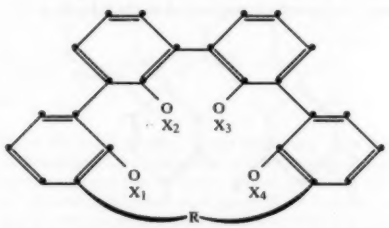
4,505,800

SODIUM-SELECTIVE COMPOSITIONS AND ELECTRODES CONTAINING SAME

John L. Toner, Webster, and Daniel S. Daniel, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 20, 1983, Ser. No. 496,738
Int. Cl.³ G01N *27/30*
U.S. Cl. 204—418 **24 Claims**

1. A sodium ion-selective composition comprising a lipophilic hemispherand represented by the structure:



wherein X_1, X_2, X_3 and X_4 are independently alkyl or alkenyl, or any one of X_1, X_2, X_3 and X_4 is taken with one of the others X_1, X_2, X_3 and X_4 to form an alkylene group or an alkylene group interrupted with heteroatoms; and R represents the atoms necessary to complete a macrocyclic ring structure having from 16 to 19 atoms in the backbone of said ring structure, with the proviso that R contains (a) at least one coordinating site for sodium ions and (b) at least two alkylene groups as

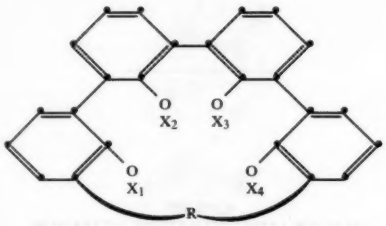
part of said ring structure; a compound capable of solvating said hemispherand and a supporting matrix.

12. A sodium ion-selective electrode comprising:

(a) a reference electrode in contact with

(b) a reference composition which is, in turn, in contact with one side of

(c) an ion-selective membrane composition comprising the hemispherand represented by the structure:



wherein X_1, X_2, X_3 and X_4 are independently lower alkyl or alkenyl, or any one of X_1, X_2, X_3 and X_4 is taken with one of the others X_1, X_2, X_3 and X_4 to form an alkylene group or an alkylene group interrupted with heteroatoms; and R represents the atoms necessary to complete a macrocyclic ring structure having from 16 to 19 atoms in the backbone of said ring structure, with the proviso that R contains (a) at least one coordinating site for sodium ions and (b) at least two alkylene groups as part of said ring structure; a compound capable of solvating said hemispherand and a supporting matrix.

4,505,801

OVERCOAT COMPOSITIONS AND ION-SELECTIVE ELECTRODES FOR IONIC ANALYTE DETERMINATIONS

Richard L. Detwiler, Rochester; Brooke P. Schlegel, Canandaigua, and Thomas R. Kissel, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 10, 1984, Ser. No. 569,695

Int. Cl.³ G01N *27/30*

U.S. Cl. 204—418 **10 Claims**

1. An overcoat composition useful in ion-selective electrodes, said composition comprising:

a. a discontinuous liquid phase comprising an oleophilic solvent dispersed within a continuous phase comprising a hydrophilic binder;

b. a complexing agent useful for extracting oleophilic anions;

c. a buffer which provides a pH in the range of from about 7.5 to about 9.5 under conditions of use; and

d. a nucleating agent.

3. An ion-selective electrode for determination of CO_2 in an aqueous liquid, said electrode comprising a support having thereon, in sequence, a metal/metal halide reference electrode zone, an electrolyte zone, a membrane zone containing an ionophore, and an overcoat zone,

said overcoat zone comprising:

a. a discontinuous liquid phase comprising an oleophilic solvent dispersed within a continuous phase comprising a hydrophilic binder;

b. a complexing agent useful for extracting oleophilic anions;

c. a buffer which provides a pH in the range of from about 7.5 to about 9.5 under conditions of use; and

d. a nucleating agent.

4,505,802

OXYGEN CONCENTRATION DETECTOR

Syunzo Mase, Ama, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

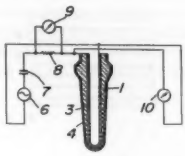
Filed May 20, 1982, Ser. No. 380,283

Claims priority, application Japan, May 25, 1981, 56-77922

The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—425 **11 Claims**



1. An oxygen concentration detector for detecting the oxygen concentration in gases comprising:

an oxygen ion conductive solid electrolyte body;

a plurality of separate electrodes contacting the solid electrolyte body, at least two of said plurality of separate electrodes having the solid electrolyte body therebetween, thereby forming an oxygen concentration cell for detecting oxygen partial pressure in a gas;

electromotive force detecting means connected to at least two of said plurality of separate electrodes having the solid electrolyte body therebetween, for detecting an electromotive force of the oxygen concentration cell;

AC supply means connected to at least two of said plurality of separate electrodes having the solid electrolyte body therebetween, for applying an AC voltage to said solid electrolyte body through said electrodes, said AC supply means being arranged to supply an AC voltage at a frequency sufficiently high such that an impedance between said electrodes to which AC voltage is applied is largely independent of interface capacitances between said electrodes to which AC voltage is applied and a surface where said separate electrodes contact said solid electrolyte body; and

impedance detecting means connected to at least two of said plurality of separate electrodes having the solid electrolyte body therebetween, for detecting an impedance of said solid electrolyte body.

4,505,803

OXYGEN CONCENTRATION DETECTOR

Syunzo Mase, Ama, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed May 28, 1982, Ser. No. 383,218

Claims priority, application Japan, Jun. 4, 1981, 56-84971

The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—425 **10 Claims**

1. An oxygen concentration detector for detecting oxygen concentration in gases, comprising:

a semiconductor body whose electric resistance varies with oxygen partial pressure of an ambient atmosphere thereof, said semiconductor body being located between at least two separate electrode and said electrodes being in contact with said semiconductor body;

a resistive body having a composition including a number of portions with a negative temperature coefficient of electric resistance and high-resistance substance layers separating said portions one from the other, at least two separate electrodes contacting said resistive body and having the resistive body located therebetween;

an AC power source connected to said at least two separate electrodes contacting said resistive body, said AC power source applying an AC current to said resistive body so as to heat the resistive body, said AC power source being arranged to supply an AC voltage at a frequency sufficiently high that an impedance between said at least two electrodes to which AC voltage is applied is largely independent of interface capacitances between said electrodes to which AC voltage is applied and a surface of said resistive body, said resistive body being so related to said semiconductor that said semiconductor is heated by said resistive body upon application of said AC current; and

means for measuring a resistance of the semiconductor body with variances of the oxygen partial pressure.

4,505,804

OXYGEN CONCENTRATION DETECTOR

Syunzo Mase, Ama, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

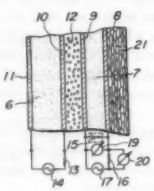
Filed May 28, 1982, Ser. No. 383,222

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1981, 84969

The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

Int. Cl.³ G01N 27/46

U.S. Cl. 204—425 **10 Claims**



1. An oxygen concentration detector for detecting oxygen concentration in gases, comprising:

a plurality of resistive bodies, each of said resistive bodies having a composition including a number of portions with a negative temperature coefficient of electric resistance and high-resistance substance layers separating said portions one from the other, and at least two separate electrodes contacting each of said plurality of resistive bodies, each of said resistive bodies being located between said at least two separate electrodes, at least one of said plurality of resistive bodies forming an oxygen concentration cell, at least one other of said plurality of resistive bodies not being an oxygen concentration cell;

an AC power source connected to said at least two separate electrodes contacting said at least one other resistive body, said AC power source applying an AC current to at least one of said other resistive bodies, so as to heat said at least one oother resistive body, said AC power source being arranged to supply an AC voltage at a frequency sufficiently high that an impedance between said at least two electrodes to which AC voltage is appled is largely independent of interface capacitances between said electrodes to which AC voltage is applied and a surface of said at least one other resistive body, said at least one other resistive body being so related to said oxygen concentration cell that said oxygen concentration cell is heated by said at least one other resistive body upon application of said AC current to said at least two electrodes contacting said at least one other resistive body; and

means for measuring a DC potential difference of the oxygen concentration cell.

4,505,805

OXYGEN CONCENTRATION DETECTOR

Syunzo Mase, Aichi, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

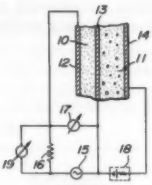
Filed May 28, 1982, Ser. No. 383,223

Claims priority, application Japan, Jun. 4, 1981, 56-84968

The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

Int. Cl.³ G01N 27/46

U.S. Cl. 204—425 **9 Claims**



1. An oxygen concentration detector for detecting oxygen concentration in gases, comprising:

a plurality of resistive bodies, each of said resistive bodies including a number of portions with a negative temperature coefficient of electric resistance and high-resistance substance layers separating said portions one from the other, and at least two separate electrodes contacting each of said plurality of resistive bodies, each of said resitive bodies being located between said at least two separate electrodes, at least one of said plurality of resistive bodies being a solid electrolyte, thereby forming an oxygen concentration cell, at least another of said plurality of resistive bodies being a solid electrolyte other than said oxygen concentration cell;

an AC power source connected to said at least two separate electrodes contacting said oxygen concentration cell, said AC power source applying an AC current to said oxygen concentration cell so as to heat said cell, said AC power source being arranged to supply an AC voltage at a frequency sufficiently high that an impedance between said at least two electrodes to which AC voltage is applied is largely independent of interface capacitances between said electrodes to which AC voltage is applied and a surface of said concentration cell;

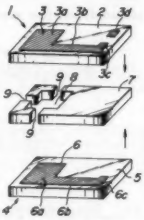
a DC source, said DC source applying a DC current to said electrolyte, for controlling oxygen partial pressure around at least one electrode contacting said oxygen concentration cell; and

means for measuring a DC potential difference of the oxygen concentration cell.

4,505,806
OXYGEN SENSOR

Tetsusyo Yamada, Nagoya, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Aug. 3, 1982, Ser. No. 404,836
Claims priority, application Japan, Dec. 21, 1981, 56-190419[U]
Int. Cl.³ G01N 27/46
U.S. Cl. 204—425 13 Claims



1. An oxygen sensor, comprising

an oxygen pump element formed of a first oxygen-ion-conductive solid electrolyte board having electrode layers attached to opposite surfaces at one end of the first board and lead wire layers extending from said electrode layers to opposite end of the first board;

an oxygen concentration cell element formed of a second oxygen-ion-conductive solid electrolyte board disposed in parallel to said first board, said second board having electrode layers attached to opposite surfaces at one end thereof in alignment with said electrode layers of said first board and lead wire layers extending from said electrode layers attached thereon to opposite end thereof; and

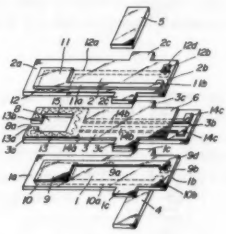
a ceramic intermediate board member disposed between said oxygen pump element and said oxygen concentration cell element, said intermediate board member having a hole bored therethrough so as to define a cavity by closing said hole with said electrode layers attached to opposite surfaces of the first board and the second board, said cavity having a thickness of 0.1–2.0 mm taken as a spacing between said oxygen pump element and said oxygen concentration cell element, and at least one passage formed through said intermediate board member so as to communicate said cavity to outside of the oxygen sensor, said at least one passage having a cross-sectional area of more than 1 mm^2 taken at right angles to direction of communication between said cavity and outside of said oxygen sensor and having a cross-sectional height substantially equivalent to the thickness of said cavity; said electrode layers and lead wire layers being metallic layers which are deposited by thick film forming technique.

4,505,807
OXYGEN SENSOR

Tetsusyo Yamada, Nagoya, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Aug. 3, 1982, Ser. No. 404,837
Claims priority, application Japan, Feb. 26, 1982, 57-27266[U]
Int. Cl.³ G01N 27/46
U.S. Cl. 204—425 16 Claims

1. An oxygen sensor, comprising an oxygen pump element having a first oxygen-ion-conductive solid electrolyte board with electrode layers attached to opposite surfaces at one end of the first board; an oxygen concentration cell element having a second oxygen-ion-conductive solid electrolyte board disposed in parallel to said first board, said second board having electrode layers attached to opposite surfaces at one end thereof in alignment with said electrode layers of said first board; a heater element inserted between said oxygen pump element and said oxygen concentration cell element and consisting of an electrically insulating plate and heat-generating resistor disposed thereon; and an electrically insulating element inserted between said oxygen pump element and oxygen concentration cell element and disposed opposingly to said heat-generating resistor; each of said heater element and said electrically insulating element having a hole bored therethrough so as to define a cavity by closing said hole with said electrode layers attached to opposing surfaces of the first board and the second board, the length and width of said holes being approximately equal to the length and width of said electrode layers, said cavity having a thickness of approximately 0.5 mm taken as a spacing between said oxygen pump element and said concentration cell element; and further having at least one passage formed through said insulating element and said heater element so as to communicate said cavity to outside of the oxygen sensor, said passage having a cross-sectional area of at least 1 mm^2 and said passage having a thickness which is equal to the thickness of said cavity to prevent said passage from becoming plugged during use, said heat-generating resistor extending on said electrically insulating plate along the periphery of said cavity, wherein a unitary structure is made by overlaying and sintering of non-sintered green bodies of said oxygen concentration cell element, said heater element, said electrically insulating element and said oxygen pump element, whereby said oxygen sensor is selectively heated to a temperature such that said oxygen concentration cell element measures a ratio between oxygen concentration in said cavity and oxygen concentration of a gas surrounding the outside of said oxygen sensor while said oxygen pump element causes oxygen diffusion therethrough between said cavity and the outside of the oxygen sensor.



4,505,808
METHOD OF EXTRACTING HYDROCARBONS FROM OIL-CONTAINING ROCK OR SAND THROUGH HYDROGENATING LOW TEMPERATURE CARBONIZATION

Gerd Brunner, Roth; Rainer Hoffmann, Nuremburg, and Konrad Künstle, Röttenbach, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim/Ruhr, Fed. Rep. of Germany

Filed Sep. 15, 1983, Ser. No. 532,826
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3236504
Int. Cl.³ C10B 53/06; C10G 1/02, 21/06
U.S. Cl. 208—11 R 10 Claims

1. Method of recovering liquid hydrocarbons from oil-containing solid minerals selected from the group consisting of oil shale and oil sands which comprises

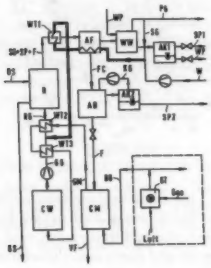
(a) subjecting the oil-containing solid minerals to hydrogenating low temperature carbonization by contact with hydrogen, carbon monoxide and steam in a reactor at temperatures of 450° to 520° C. and a pressure of about 50 to 150 bar,

(b) discharging from the reactor an effluent which is a mixture of normally (at standard temperature and pressure) gaseous constituents containing hydrogen, carbon monoxide, carbon dioxide and ethane, water vapor, normally (at

standard temperature and pressure) liquid low boiling hydrocarbons, normally (at standard temperature and pressure) liquid high boiling hydrocarbons, and solid particles containing combustible carbonaceous material and non-combustible minerals,

(c) cooling the reactor effluent to a temperature of 350°±25° C. to effect condensation of the normally liquid high boiling hydrocarbons and separating the condensed high boiling hydrocarbons which have suspended therein the solid particles from the remainder of the effluent which is a mixture of the gaseous constituents, water vapor and vaporous low boiling hydrocarbons

(d) scrubbing the mixture of the gaseous constituents, water vapor and vaporous low boiling hydrocarbons with water under pressure and cooling to a temperature of 250°±25° C. sufficient to condense the vaporous low boiling hydrocarbons and remove at least in part carbon dioxide and carbon monoxide by solution in the water,



(e) separating the uncondensed gaseous constituents containing hydrogen from the condensate of low boiling hydrocarbons and water and returning at least a portion of the uncondensed gaseous constituents containing hydrogen to the reactor,

(f) subjecting the condensate of high boiling hydrocarbons containing suspended solids to a solids separation by contact with a circulating gas of carbon dioxide and a C_6/C_7 hydrocarbon fraction to effect settling of the suspended solids,

(g) withdrawing the settled solids and subjecting the solids to contact with hot combustion gases containing carbon dioxide to effect reaction of the carbonaceous material in the solids with the carbon dioxide in the hot combustion gases to produce carbon monoxide,

(h) and directing the gases containing carbon monoxide and carbon dioxide from reaction of the hot combustion gases with the carbonaceous solids to the reactor.

4,505,809
PROCESS AND APPARATUS FOR EXTRACTING HYDROCARBONS FROM OIL SHALE

Gerd Brunner, Roth; Rainer Hoffmann, Nuremberg, and Konrad Künstle, Röttenbach, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 546,890

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 3240745

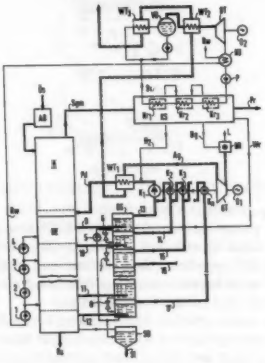
Int. Cl.³ C10G *1/02;* **C10B** *53/06, 39/04*

U.S. Cl. 208—11 R **7 Claims**

1. A process for extracting hydrocarbons from oil shale comprising the steps of subjecting oil shale in the presence of hydrogen and steam to low temperature hydrogenating distillation under superatmospheric pressure; separating the resulting fluid distillation mixture into liquid and gaseous products; and returning water and hydrogen separated from the fluid distillation to the low temperature distillation; in which:

(a) heat is drawn-off from the hot oil shale, after the low temperature hydrogenating distillation treatment in a low temperature hydrogenating distillation reactor, by discharging the treated shale from the reactor and passing the shale through zones of decreasing pressure, spraying the shale in the zones with water producing saturated steam in decreasing pressure stages;

(b) the saturated steam of the pressure stages commingled with saturated steam from the water separated from the



fluid distillation mixture are fed into the individual stages of a multi-stage compressor driven by a gas turbine and are then delivered through a steam supply line to the reactor;

(c) the gas turbine is fueled by supplying thereto gaseous distillation products separated from the fluid distillation mixture; and

(d) the exhaust gases of the gas turbine are fed to a heat exchanger arranged in the steam supply line to heat the steam in the steam supply line to a higher temperature prior to the entrance into the reactor.

4,505,810
HYDROGEN TETRACHLOROALUMINATE AS A CO-CATALYST WITH SODIUM TETRACHLOROALUMINATE FOR THE CONVERSION OF HEAVY HYDROCARBONS

Mark A. Plummer, Littleton, and Robert C. Bugle, Fort Collins, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 30, 1983, Ser. No. 567,195

Int. Cl.³ C10G *11/08, 19/067, 29/12, 47/08*

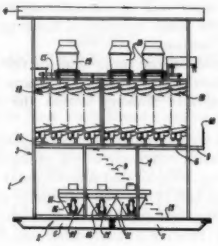
U.S. Cl. 208—108 **23 Claims**

1. A process for producing a lower average molecular weight product from a higher molecular weight hydrocarbon feedstock comprising contacting said feedstock with a molten salt system consisting essentially of $NaAlCl_4$ and $HAlCl_4$, having substantially no excess NaCl or $AlCl_3$ and having from about 0.5 to about 25 weight percent $HAlCl_4$, at a pressure of about 0.8 to about 140 atmospheres and a temperature above about 200° C.

4,505,811
MINERAL PROCESSING APPARATUS

Anthony J. Griffiths, Berkeley Vale, and David W. Allen, North Perth, both of Australia, assignors to Vickers Australia Limited, Melbourne, Australia

Filed Oct. 14, 1983, Ser. No. 543,116
Claims priority, application Australia, Oct. 15, 1982, PF6368
Int. Cl.³ B03B 7/00
U.S. Cl. 209—17 22 Claims



1. Mobile mineral processing apparatus comprising; a plurality of groups of gravity concentrators, at least one of which includes spiral concentrators; a plurality of treatment means including primary separation means, scavenging means, and cleaning means; each of at least two of said treatment means including a said group of gravity concentrators; at least one module carrying said treatment means, water reticulation means and control means for regulating the flow of material through said apparatus; said module having a base, a frame structure and a roof, and said base is engagable with the ground for movement thereover.

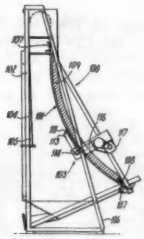
13. Mobile mineral processing apparatus comprising; a plurality of modules, each of which includes a base, a frame structure and a roof, each said base having ground engaging means such that the respective module can be moved over the ground from place to place; each said module being of demountable construction such as to permit partial separation for convenient transport from one location and reassembly at another location; said modules include a preliminary separation module and a concentrate module, each of which carries a respective part of water reticulation means and control means for regulating the flow of material through said apparatus; said preliminary separation module includes separation means for dividing feed material into treatment and waste components, and transfer means for transporting said treatment component to said concentrate module; and said concentrate module includes a plurality of groups of gravity concentrators forming primary separation means, scavenging means and cleaning means, at least some of said gravity concentrators being spiral concentrators, and said gravity concentrators are arranged to receive and process said treatment component.

4,505,812
SIEVE SCREEN DECK

Jeremy J. Lees, Sydney, Australia, assignor to Ilecard Pty. Limited, Sydney, Australia

Filed Apr. 22, 1983, Ser. No. 487,709
Claims priority, application Australia, Mar. 30, 1983, 12997/83
Int. Cl.³ B07B 1/34
U.S. Cl. 209—275 4 Claims

1. A sieve screen deck, comprising a sloping, self supporting sieve screen having two opposed end edges, rapping or vibrating means to cause the sieve screen to vibrate, and a frame to which the sieve screen is connected, the sieve screen including sieving means defining a plurality of substantially parallel narrow slots and an array of backing bars connected to the sieve means which render the sieve screen self supporting, the sieve screen being connected to the frame only at or adjacent its two end edges and at least one of the connections being through a resilient means allowing limited vibrational movement between the sieve screen and the frame, a side wall being provided substantially along the full length on each side of the sieve screen spaced from and free of contact with the frame along the full length of the side walls and being of such a height so as to prevent material which is passing across the sieve

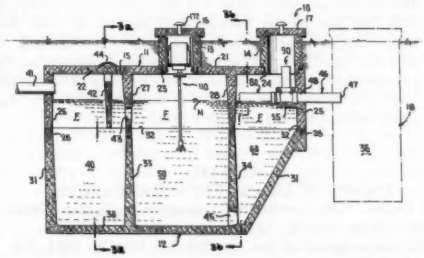


screen between the two end edges from flowing over an edge of the sieve screen intermediate the said end edges, each side wall being formed of a resilient synthetic plastics material or rubber such that they do not impede substantially the ability of the sieve screen to vibrate and flex under the influence of the rapping or vibrating means.

4,505,813
WASTEWATER TREATMENT PLANT

Jan D. Graves, Norwalk, Ohio, assignor to Norwalk Wastewater Equipment Company, Norwalk, Ohio

Filed Jun. 14, 1982, Ser. No. 388,246
Int. Cl.³ C02C 1/02
U.S. Cl. 210—86 69 Claims



1. A wastewater treatment plant comprising means for defining a pretreatment chamber, means defining an inlet for introducing fluid into said pretreatment chamber, means for defining an aeration chamber, means for conducting fluid from said pretreatment chamber into said aeration chamber, rotating means for aerating the fluid in said aeration chamber, means for defining a clarification chamber, means for conducting fluid from said aeration chamber into said clarification chamber, means defining an outlet for discharging the fluid from said clarification chamber, means for filtering the fluid discharging from said clarification chamber, said filtering means having a filtering surface of a predetermined area, said filtering surface being positioned such that only a portion of said predetermined filtering surface area is operative at a predetermined fluid level in said clarification chamber and other portions of said predetermined filtering surface area are rendered progressively operative as the predetermined fluid level rises thereby increasing the filtering capacity of said filtering means in response to fluid level rise in said clarification chamber, said rotating aerating means carrying means for inducing torque in response to an inoperative condition of said filtering means and

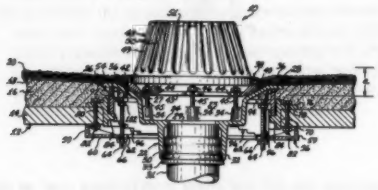
a corresponding rise in the fluid level in said aeration chamber, and means for responding to the induced torque.

4,505,814

ADJUSTABLY EXTENSIBLE ROOF DRAIN RECEPTACLE

Marshall W. Marshall, Tyler, Tex., assignor to Tyler Pipe, North Swan, Tex.

Filed Apr. 18, 1983, Ser. No. 486,072
Int. Cl.³ E03F *1/00*
U.S. Cl. 210—166 **20 Claims**



1. In a combination of a roof structure with an adjustably extensible roof drain receptacle comprising:

(a) a roof structure having means defining an opening, said roof structure including a roof deck having an upper surface with roofing materials thereon to provide said roof structure with an upper surface;

(b) a drain pipe substantially coaxial with the opening of said roof structure and extending downwardly therefrom;

(c) a one piece drain body in the opening of said roof structure and having an open top for receiving water to be drained from the upper surface of said roof structure, said drain body having a bottom outlet directly connected in a leakproof manner to said drain pipe; and

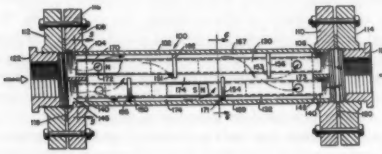
(d) extension means disposed about said drain body and attached to the upper surface of the roof deck of said roof structure and to the periphery of said drain body for supportingly mounting said drain body in the opening of said roof structure, said extension means being vertically adjustably extensible to position the open top of said drain body at a proper water receiving position relative to the upper surface of said roof structure.

4,505,815

MAGNETIC LIQUID TREATING DEVICE

Carl Lindler, Summerville, S.C., assignor to Descal-A-Matic Corporation, Norfolk, Va.

Continuation-in-part of Ser. No. 264,166, May 15, 1981, Pat. No. 4,366,053. This application Dec. 27, 1982, Ser. No. 452,985
The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.
Int. Cl.³ B01D *35/06*
U.S. Cl. 210—223 **4 Claims**



1. A magnetic liquid treating device comprising:

an outer cylindrical housing having outer ends and outer and inner walls;

inner fittings removably attached to the outer ends of the outer cylindrical housing;

outer fittings removably attached to the inner fittings;

end connections removably attached to the outer fittings;

an inner cylindrical housing having inner and outer walls and having openings in the ends thereof;

a plurality of magnets contained within the inner cylindrical housing, said plurality of magnets being arranged longitudinally and in axial alignment with each other and arranged such that like poles are adjacent each other;

end plugs in the ends of the inner cylindrical housing to retain said magnets therein;

means secured to the inner cylindrical housing and extending to the inner wall of the outer cylindrical housing for centering the inner cylindrical housing within the outer cylindrical housing;

rings in recesses in the inner wall of the outer cylindrical housing abutting the centering means for retaining the inner cylindrical housing within the outer cylindrical housing, and

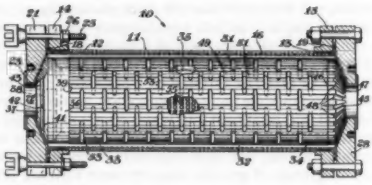
a plurality of semi-circular baffles in spaced apart relationship from each other extending along the length of the inner housing, each of said semi-circular baffles extending through one half of the inner diameter of the outer cylindrical housing, said plurality of semi-circular baffles staggered at 90° relative to each other and completing a 360° turn between the outer and inner housings whereby liquid passing through spaces between the inner cylindrical housing and the outer cylindrical housing flows in a spiral and turbulent motion and whereby the magnetic fields extending from like poles of adjacent magnets extend between the baffles and cut the liquid causing precipitation of the minerals in the liquid.

4,505,816

FILTER SUPPORT ASSEMBLY

Leonard J. Wozniak, and William C. Brasie, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 30, 1984, Ser. No. 575,246
Int. Cl.³ B01D *29/16*
U.S. Cl. 210—439 **7 Claims**



1. A filter support member comprising a hollow cylindrical housing having a first end and a second end, the generally hollow cylindrical housing having a first end cap affixed to the first end, the end cap defining a generally centrally disposed opening of a diameter less than the diameter of the hollow cylindrical housing, a second generally like end cap disposed on the second end thereof, a filter support core disposed within space enclosed by first and second end caps and the housing, the core comprising a generally hollow cylindrical body having a first end and a second end, the body first end being disposed adjacent the first end cap and the second end being disposed adjacent the second end cap; the first end of the filter support body being in contact with a first end plate, the first end plate defining a generally centrally disposed passageway therethrough, providing communication between a space internal to the body and a generally cylindrically disposed passage in the first end cap, the first body end plate being in liquid-tight sealing engagement with the first end cap; a second end plate adjacent the second end of the filter support; the second end plate adjacent the second end cap defining a plurality of radially extending grooves providing communication between space external to the filter support body and the

passageway of the second end cap; the body defining a plurality of generally radially extending passages, the passages providing communication between a space internal to the body and space external thereto, the external surface of the body defining a plurality of axially extending lands and grooves; the internal surface of the body defining a plurality of generally radially inwardly extending bodies, the bodies covering not more than 35 percent of the area of a projected internal surface of the body; and desirably 30 percent.

4,505,817

FIBRIN GEL-CONTAINING FILTER OF POROUS MATERIAL

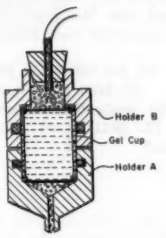
Birger Blomback, and Masahisa Okada, both of New York, N.Y., assignors to New York Blood Center, Inc., New York, N.Y.

Division of Ser. No. 395,768, Jul. 6, 1982,. This application Jun. 5, 1984, Ser. No. 617,663

Claims priority, application Sweden, Dec. 30, 1981, 8107864

Int. Cl.³ B01D *39/18;* C12N *1/00*

U.S. Cl. 210—484 **19 Claims**



1. A filter comprising a porous plastic material having cast therein a fibrin gel, said fibrin gel having substantially uniform pores.

4,505,818

LIQUID CHROMATOGRAPHIC COLUMN PACKING MATERIAL

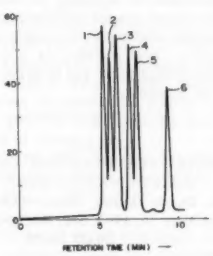
Yoshiyuki Mukoyama; Osamu Hirai, and Tetsuya Aoyama, all of Hitachi, Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1983, Ser. No. 534,077

Claims priority, application Japan, Sep. 24, 1982, 57-167361

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—502.1 **3 Claims**



1. A liquid chromatographic column packing material comprising porous styrene-divinylbenzene copolymer particles having $-SO_3^-$ groups and, as counterion thereof, ions represented by the formula:

$$^+NH_nX_m \quad (I)$$

wherein X is $-CH_2OH$, $-CH_2CH_2O)_pH$ or $-CR'_q(CH_2OH)_r$ group; R' is hydrogen or a lower alkyl group; q is zero or an integer of 1 or 2, r is an integer of 1 to 3, and $q+r=3$; p is an integer of 1 to 10; n is zero or an integer of 1; and m is an integer of 3 or 4, **but** $m+n=4$.

4,505,819

METHOD FOR THE ANAEROBIC DEGRADATION OF ORGANIC MATERIAL

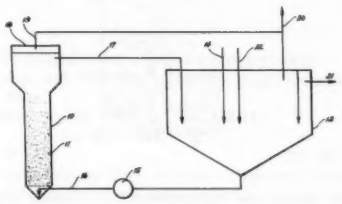
David Barnes, Caringbah, and Peter J. Bliss, North Ryde, both of Australia, assignors to Unisearch Limited, Kensington, Australia

Continuation of Ser. No. 293,078, Aug. 17, 1981, abandoned. This application Jul. 13, 1983, Ser. No. 513,525

Claims priority, application Australia, Aug. 18, 1980, PE5098/80

Int. Cl.³ C02F *3/28*

U.S. Cl. 210—603 **15 Claims**



1. In a process for the anaerobic bacterial degradation of organic material present in an aqueous medium waste stream comprising introducing the influent waste stream into a system comprised of a holding tank and a fluidized bed anaerobic reactor, recycling at least in part the waste stream between the fluidized bed and the holding tank to anaerobically degrade organic material present in the waste stream in the fluidized bed, and discharging treated effluent from the system, the improvement comprising:

introducing a high strength aqueous medium waste stream having a BOD concentration of at least 1,500 mg/l first into a holding tank of sufficient size and having a sufficient population of anaerobic bacteria therein to conduct degradation of organic components in the influent waste stream whereby said holding tank functions as a contact reactor under anaerobic conditions;

pumping the aqueous medium waste stream from the contact reactor into a fluidized bed reactor maintained under anaerobic conditions, having an effective volume not more than 0.35 times the effective volume of the contact reactor and containing a bed of finely divided inert solid supporting a population of substantially anaerobic bacteria, at a rate effective to maintain the bed in a fluidized state and to also conduct degradation of organic components in the waste stream;

treating the aqueous medium waste stream in said contact reactor and fluidized bed reactor under temperature conditions and for a residence time sufficient to generate methane, both in said contact reactor and said fluidized bed reactor;

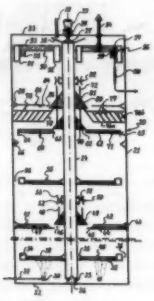
returning at least a part of the aqueous medium waste stream, which has passed through the fluidized bed reactor, to the contact reactor at a rate effective to achieve multiple passage of the aqueous medium through the contact reactor and the fluidized bed reactor; and

withdrawing a treated effluent stream from at least one of the fluidized bed reactor and the contact reactor whereby higher purification levels can be attained than when conducting purification in a fluidized bed reactor connected to a holding tank.

4,505,820
METHOD FOR CLEANING WASTE WATER

Bastiaan B. Eertink, Land Van Kessel 7, 5971 Dh Grubbenvorst, Netherlands

PCT No. PCT/NL81/00019, § 371 Date Feb. 18, 1982, § 102(e) Date Feb. 18, 1982, PCT Pub. No. WO82/00633, PCT Pub. Date Mar. 4, 1982
PCT Filed Jul. 20, 1981, Ser. No. 355,567
Claims priority, application Netherlands, Aug. 20, 1980, 8004724
Int. Cl.³ C02F 3/26
U.S. Cl. 210—604 10 Claims



1. A process for microbiologically cleaning waste water wherein waste water is treated with oxygen gas and mixed with activated mud, which comprises flowing the waste water through a plurality of mutually superposed reactor chambers in succession at a rate such that the time of retention of the waste water in each reactor chamber is at least three minutes, each said chamber being substantially separated from yet in hydrostatic communication with another in a vertically elongate container; injecting oxygen gas into and mixing the gas in the form of bubbles with the waste water in a lower of said chambers; in at least one of said chambers collecting gas bubbles rising through the waste water into at least one downwardly open horizontally extended pocket holding collected gas in contact with and under hydrostatic pressure from an underlying body of waste water and by said pressure forcing collected gas from said pocket upwardly and into the waste water in an overlying chamber of said container; removing gas from an upper chamber of said container; and in an uppermost chamber thereof separating treated waste water from activated mud for delivery of the treated water from the container; and passing the activated mud downward into an underlying chamber;

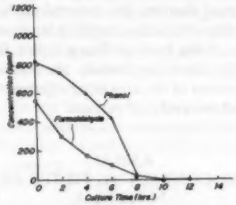
said container being sufficiently tall and said flowing of waste water being effected so that the waste water is passed with a decompression of at least seven meters water column from the lowermost of said reactor chambers to said uppermost chamber.

4,505,821
METHOD OF TREATING WASTE LIQUORS CONTAINING PHENOLICS AND FORMALDEHYDE

Yasuyuki Kaneko, Nagoya; Masao Ito, Anjyo; Yukio Ogura, and Jiro Ishikawa, both of Hiratsuka, all of Japan, assignors to Nagoya University, Nagoya, Japan

Filed May 21, 1984, Ser. No. 612,211
Claims priority, application Japan, May 20, 1983, 58-87603
Int. Cl.³ C02F 3/34; C12R 1/645
U.S. Cl. 210—611 9 Claims

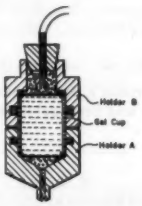
1. A method of treating a waste liquor containing phenolics and formaldehyde, comprising culturing a fungus of Trichosporon sp. No. 36, FERM P-6977 which has a capability of decomposing and assimilating a high concentration of phenolics in the coexistence of a high concentration of formaldehyde, thereby to remove phenolics and formaldehyde contained in the waste liquor from the waste liquor.



4,505,822
PROCESS FOR SEPARATING SUBSTANCES FROM ONE ANOTHER USING A FIBRIN GEL FILTER

Birger Blomback, and Masahisa Okada, both of New York, N.Y., assignors to New York Blood Center, Inc., New York, N.Y.

Division of Ser. No. 395,768, Jul. 6, 1982,. This application Mar. 26, 1984, Ser. No. 593,996
Claims priority, application Sweden, Dec. 30, 1981, 8107864
Int. Cl.³ B01D 15/08, 37/00; C12N 7/02
U.S. Cl. 210—635 17 Claims



1. A process for separating a first substance having a size of 0.003 to 1 μm from a second substance with which it is in admixture said second substance having a larger size than said first substance which comprises passing said mixture of said first substance and second substances over a filter comprising fibrin gel form having pores of substantially uniform size, said gel having pores of a size to permit passage therethrough of said first substance but excluding said second substance, said filter comprising means for retaining the shape of at least the upper surface of said gel against deformation when contacted by a flowing medium, said means for retaining the shape comprising a foraminous sheet member or a foam, wherein the effective pore size of said fibrin gel is larger than the particle size of said second substance.

4,505,823
FILTERING DEVICE FOR TREATING CONTAMINATED AQUEOUS SOLUTIONS

Max Klein, P. O. Box 3, Dalton, Mass. 01226

Filed May 16, 1983, Ser. No. 494,701
Int. Cl.³ B01D 39/16
U.S. Cl. 210—668 30 Claims

15. A method for using a filter element in the treatment of a contaminated aqueous solution which method comprises:

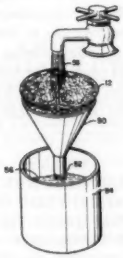
(a) providing a filter mat consisting essentially of a wet laid, porous, non-woven matrix having randomly arranged, irregularly intersecting and overlapping cellulose fibers, said fibers intermixed with polymer micro-bits of an ex-

panded, non-brittle thermoplastic polymer selected from the group of a styrene-polymer, a polyolefin having from 2 to 6 carbon atoms, or copolymers or blends thereof, or micro-bits of a flexible foamed polyurethane, said polymer micro-bits being substantially free of intact cells of the expanded polymer from which they were produced, the amount of said micro-bits present in said mat being sufficient to provide the mat with the degree of porosity and flow-rate level required for filtering said contaminated aqueous solution, and which mix includes at least one of the following:

(i) fibers of a fiber-forming polyethylene terephthalate; and

(ii) an adsorbing agent selected from the group consisting of finely divided activated carbon, diatomaceous earth, and colloidal alumina monohydrate;

said filter mat provided in a predetermined geometrical



shape and folded along perpendicular lines to define a four-layered filter element, each layer of which is defined between a pair of fold lines, forming a right-angle apex, in which fold lines the structural integrity of said mat is intact, said fold lines exhibiting a memory tending to return said mat to said folded four-layered configuration; and

(b) separating one layer of said folded filter element from the remaining three layers to form a cone-shaped structure;

(c) supporting said cone-shaped structure in a filter support having a central opening and placing said filter support with its opening communicating with a receiving vessel to enable containment of treated aqueous solution in said vessel; and

(d) filtering of said contaminated solution by pouring said contaminated aqueous solution through said cone-shaped filter element and said opening into said vessel, to thereby remove said contaminant.

4,505,824

METHOD AND APPARATUS FOR PURIFYING LIQUID USING AN ELECTROMAGNETIC FILTER

Kazuhiko Akamine, Suwadai-ryo, 2-3, Takasuzu-cho, Hitachi-shi, Ibaraki-ken; Katsuya Ebara, 1400, Motoyoshida-cho, Mito-shi, Ibaraki-ken; Kazuyuki Ito, 6-20-3, Ayukawa-cho, and Shinji Mitani, 1050-46, Moriyama-cho, both of Hitachi-shi, Ibaraki-ken, all of Japan

Filed Oct. 18, 1982, Ser. No. 434,852

Claims priority, application Japan, Nov. 2, 1981, 56-174634

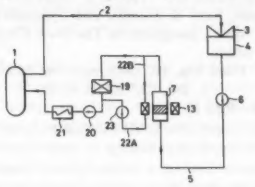
Int. Cl.³ B01D *35/06*

U.S. Cl. 210—695 **16 Claims**

2. A method of purifying a liquid containing magnetic solid particles in an electromagnetic filter in a nuclear power plant comprising the steps of:

passing liquid to be treated through said electromagnetic filter to contact a matrix which is magnetized by an electromagnetic coil, thereby separating out said particles contained in said liquid; and

diverting a portion of said liquid free of said particles from a downstream side of said electromagnetic filter to produce a cooling liquid and passing said diverted cooling liquid



through said electromagnetic coil for cooling said electromagnetic coil.

4,505,825

OIL WELL DRILLING CLAY CONDITIONER

William J. Detroit, Schofield, Wis., assignor to Reed Lignin Inc., Rothschild, Wis.

Filed Sep. 22, 1983, Ser. No. 534,722

Int. Cl.³ C09K *7/02*

U.S. Cl. 252—8.5 C **20 Claims**

1. An oil well drilling fluid additive comprising boron-chrome complexed sulfonated lignin-containing material having from about 1 to about 3 percent by weight boron and from about 2 to about 5 percent by weight chrome.

7. An oil well drilling fluid composition comprising an aqueous suspension of clay material and an effective dispersing amount of a boron-chrome complexed sulfonated lignin-containing material having from about 1 to about 3 percent by weight boron and from about 2 to about 5 percent by weight chrome.

4,505,826

PREPACKAGED CROSSLINKED POLYMER

Roger L. Horton, Littleton, Colo., assignor to Smith International Inc., Newport Beach, Calif.

Filed Oct. 25, 1982, Ser. No. 436,641

Int. Cl.³ E21B *43/26*

U.S. Cl. 252—8.55 R **13 Claims**

1. A mixture of dry ingredients capable of forming a crosslinked polymer upon hydration comprising:

(a) A polysaccharide having a molecular weight of at least about 100,000 selected from the group consisting of carboxymethylhydroxypropylguar, and carboxymethylhydroxyethylcellulose;

(b) A crosslinking agent selected from the group consisting of zirconium acetyl acetonate and mixtures of zirconium acetyl acetonate and aluminum acetyl acetonate at a ratio of 1:1, having a solubility rate greater than or equal to the hydration rate of the polysaccharide, in an amount sufficient to crosslink essentially all the polysaccharide chains; and

(c) A pH-adjusting agent selected from the group consisting of sodium diacetate and fumaric acid and a combination of fumaric acid and sodium bicarbonate in an amount necessary to cause the mixture to attain the required pH for the crosslinking reaction upon hydration;

in which the ratio of a:b is about 4:1 to 9:1 and the ratio of b:c is about 1:1 to 2:1.

4,505,827

TRIBLOCK POLYMERS OF THE BAB TYPE HAVING HYDROPHOBIC ASSOCIATION CAPABILITIES FOR RHEOLOGICAL CONTROL IN AQUEOUS SYSTEMS

Gene D. Rose; Kent S. Dennis, and Syamalarao Evani, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 19, 1983, Ser. No. 533,400
Int. Cl.[3] E21B *43/20*
U.S. Cl. 252—8.55 R 17 Claims

1. A water-dispersible BAB triblock polymer comprising (1) B-blocks which are alkyl having at least 4 carbons or a hydrophobic polymer having a polyethylenic backbone having a plurality of pendant hydrophobic aromatic moieties which hydrophobic moieties are capable of hydrophobe association in an aqueous medium or a combination of the alkyl and the hydrophobic polymer and (2) an A-block which is a hydrophilic polymer having a polyethylenic backbone and a plurality of pendant hydrophilic aromatic moieties.

12. A drilling mud formulation containing the polymer of claim 1 in an amount sufficient to control the rheology of the formulation.

4,505,828

AMPHOTERIC WATER-IN-OIL SELF-INVERTING POLYMER EMULSION

Stanley A. Lipowski, Livingston, and John J. Miskel, Jr., Mendham, both of N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Division of Ser. No. 482,407, Apr. 6, 1983, Pat. No. 4,431,548, which is a division of Ser. No. 308,175, Oct. 5, 1981, Pat. No. 4,392,917, which is a division of Ser. No. 84,986, Oct. 15, 1979, Pat. No. 4,330,450. This application Dec. 1, 1983, Ser. No. 541,544
Int. Cl.[3] E21B *43/22*
U.S. Cl. 252—8.55 D 9 Claims

1. In secondary and tertiary recovery of petroleum by water flooding processes, the improvement which comprises adding to the water flood an effective amount from about 0.005% to about 1.0% by weight based on the weight of the water in the flood of

an amphoteric water-in-oil self-inverting polymer emulsion having

(a) from about 10 to about 50 parts by weight of a polymer selected from the group consisting of

(1) a copolymer having from about 30 to about 99 parts by weight of a water soluble nonionic vinyl monomer and from about 1 to about 70 parts by weight of a water soluble amphoteric vinyl monomer, and

(2) a terpolymer having from about 30 to 98 parts by weight of a water soluble nonionic vinyl monomer, from about 1 to about 35 parts by weight of a water soluble anionic vinyl monomer and from about 1 to about 35 parts by weight of a water soluble cationic vinyl monomer,

(b) from about 10 to about 50 parts by weight of water,

(c) from about 5 to about 50 parts by weight of a hydrophobic liquid,

(d) from about 2 to about 25 parts by weight of a water-in-oil emulsifying agent, and

(e) from about 1 to about 15 parts by weight of an inverting surfactant

wherein the polymer is in the aqueous phase to improve recovery of petroleum.

4,505,829

LUBRICATING OIL COMPOSITION CONTAINING SEDIMENT-REDUCING ADDITIVE

Max J. Wisotsky, Highland Park, N.J., assignor to Exxon Research & Engineering Co., Florham, N.J.

Continuation of Ser. No. 147,707, May 8, 1980, abandoned. This application Oct. 29, 1981, Ser. No. 316,142
Int. Cl.[3] C10M *1/48*
U.S. Cl. 252—32.7 E 12 Claims

1. A storage stable lubricating oil composition having a reduced tendency to form sediment comprising a lubricating oil containing:

(a) 0.01 to 2 percent by weight of a polycarboxylic acid-glycol ester friction reducing component;

(b) 0.1 to 10 percent by weight of an oil-soluble alkenyl succinimide or borated alkenyl succinimide dispersant;

(c) an oil-soluble stabilizer additive being a polyol or polyol anhydride partial ester of a C_{18}–C_{22} unsaturated fatty acid in an amount effective to reduce the tendency of said lubricating oil compositions to form sediment, and

(d) a metal containing additive being a normal or basic metal phenate, sulfurized phenate or sulfonate in an amount of from 2 to 5 weight percent or a zinc dialkyldithiophosphate in an amount of from about 1 to 3 weight percent.

4,505,830

METAL WORKING USING LUBRICANTS CONTAINING BASIC ALKALI METAL SALTS

James N. Vinci, Mayfield Heights, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Sep. 21, 1981, Ser. No. 304,526
Int. Cl.[3] C10M *1/38*
U.S. Cl. 252—33 8 Claims

1. A method for lubricating metal during working thereof which comprises applying to said metal a water-free composition comprising (A) a major amount of a lubricating oil; (B) a minor amount of a basic alkali metal salt of at least one acidic organic compound, or a borated complex of said basic alkali metal salt; and (C) a minor amount of at least one sulfurization product of an aliphatic, arylaliphatic or alicyclic olefinic hydrocarbon containing from about 3 to about 30 carbon atoms, said sulfurization product containing active sulfur.

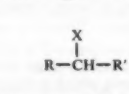
4,505,831

METHOD OF PRESERVATION OF AQUEOUS SYSTEMS BY ADDITION TO SAID SYSTEMS OF QUATERNARY AMMONIUM SALTS OF HEXAMETHYLENETETRAMINE

Joseph G. Fenyes, Germantown, and John D. Pera, Cordova, both of Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Jun. 20, 1983, Ser. No. 505,582
Int. Cl.[3] C10M *1/32*
U.S. Cl. 252—34 11 Claims

1. A method of inhibiting the growth and proliferation of microorganisms in an aqueous system selected from the group consisting of solutions, emulsions, and suspensions which are susceptible to microbiological degradation which comprises adding to said system in an amount sufficient to inhibit the growth and proliferation of said microorganisms a quaternary ammonium compound formed by reacting in approximately equimolar quantities hexamethylenetetramine and a halogen-containing compound having the formula



wherein X is chlorine or bromine, R is hydrogen or methyl, and R′ is —COOH, —COOM, or —$CONH_2$, and wherein M is sodium, potassium, or ammonium.

4,505,832

ANTI-FRETTING ADDITIVE FOR GREASE COMPRISING THE REACTION PRODUCT OF AN ALKENYL SUCCINIC ANHYDRIDE AND AN ALKANOLAMINE

James R. Whiteman, Port Arthur; Robert S. Edwards, Nederland, both of Tex., and Jerry C. Perciful, Danbury, Conn., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,445
Int. Cl.[3] C10M *5/12, 5/14, 5/20*
U.S. Cl. 252—42.1 12 Claims

1. An anti-fretting grease composition comprising a major amount of a lubricating oil having a thickener from the class consisting of 16 to 20 wt% polyurea soap and 10 to 14 wt% lithium soap and an effective anti-fretting amount of an additive selected from the group consisting of N,N'-di(2-hydroxyethyl)-n-tetradecenyl succinamide, N-(2-hydroxyethyl)-n-tetradecenyl succinamic acid and N-(2-hydroxyethyl)-n-tetradecenyl succinimide.

4,505,833

STABILIZING CLAYEY FORMATIONS

Stanley A. Lipowski, Livingston; John J. Miskel, Jr., Mendham, both of N.J., and Martin J. Schick, New York, N.Y., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Oct. 3, 1983, Ser. No. 538,211
Int. Cl.[3] C09K *7/00*
U.S. Cl. 252—8.5 C 12 Claims

1. A method of stabilizing a clayey geological formation comprising treating the formation with a solution of carrier fluid containing an effective amount of a quaternized oligomer which is a reaction product of a precondensate of a polyamine having a primary amino group and a tertiary amino group with a difunctional reactant and then with a dihalogenated hydrocarbon ether to prevent, inhibit or reduce swelling or migrating of clay particles in the formation of swelling of clay particles in the carrier fluid.

4,505,834

LUBRICATING OIL COMPOSITIONS CONTAINING GRAFT COPOLYMER AS VISCOSITY INDEX IMPROVER-DISPERSANT

Andrew G. Papay, Manchester, and Joseph P. O'Brien, Kirkwood, both of Mo., assignors to Edwin Cooper, Inc., St. Louis, Mo.

Filed Oct. 27, 1980, Ser. No. 201,515
Int. Cl.[3] C10M *1/32*
U.S. Cl. 252—51.5 A 16 Claims

1. An oil soluble viscosity index improver having dispersant properties adapted for use in lubricating oil, said viscosity index improver being a product made by a process comprising

(a) dissolving an ethylene/α-olefin copolymer containing up to 10 weight percent non-conjugated diene monomer units in a hydrogen-treated mineral oil solvent, said copolymer having an average molecular weight of about 1000–500,000,

(b) reacting the resultant copolymer solution with maleic acid, anhydride, or acid ester in the presence of a free radical-producing catalyst, thereby grafting succinic groups to said copolymer to form an intermediate, and

(c) reacting said intermediate with an aliphatic hydrocarbyl amine having the structure

$$R—NH—CH_2CH_2CH_2)_nNH_2$$

wherein R is an aliphatic hydrocarbon group containing about 12–33 carbon atoms and n is an integer from 1 to about 3, in an amount sufficient to provide at least one primary amine group for each of said succinic groups.

16. A lubricating oil composition comprising a major amount of oil of lubricating viscosity and a minor dispersant amount of an oil soluble additive having dispersant and viscosity index improving properties, said additive being the product made by a process comprising

(a) dissolving an ethylene/α-olefin copolymer containing up to 10 weight percent non-conjugated diene monomer units in a hydrogen-treated mineral oil solvent, said copolymer having an average molecular weight of about 1000–500,000,

(b) reacting the resultant copolymer solution with maleic acid, anhydride, or acid ester in the presence of a free radical-producing catalyst, thereby grafting succinic groups to said copolymer to form an intermediate,

(c) reacting the resultant intermediate with at least one mole of a C_{1-10} monohydroxy alcohol per mole of said succinic groups to form an acid-ester intermediate, and then

(d) reacting said acid-ester with an aliphatic hydrocarbyl amine having the structure

$$R—NH—CH_2CH_2CH_2)_nNH_2$$

wherein R is an aliphatic hydrocarbon group containing about 12–33 carbon atoms and n is an integer from 1 to about 3, in an amount sufficient to provide at least one primary amine group for each of said succinic groups, while distilling out alcohol displaced by said amine.

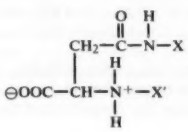
4,505,835

LUBRICANT OIL COMPOSITION CONTAINING A FRICTION MODIFIER

Rodney L. Sung, Fishkill; Benjamin H. Zoleski, Beacon; Sheldon Herbstman, Spring Valley, and Peter Dorn, Lagrangeville, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,348
Int. Cl.[3] C10M *1/36*
U.S. Cl. 252—51.5 A 9 Claims

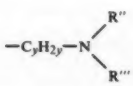
1. A cylinder lubricant composition comprising a mineral lubricant and a friction modifying amount of a reaction product between an amine and maleic anhydride represented by the formula:



in which X and X' are either:

(A)

in which R and R' can be primary aliphatic radicals and the total number of carbon atoms in R plus R' varies from about 10 to about 30, and wherein the nitrogen is bound to a secondary carbon atom, or wherein R is a hydrogen atom and R' is a branched hydrocarbon radical having from about 10 to 30 carbon atoms, or



(B)

in which R'' is a hydrocarbon radical having from about 6 to about 30 carbon atoms, R''' is hydrogen or a methyl radical and y varies from 2 to 6.

4,505,836

PLASTIC BOTTLE CLEANER COMPOSITION AND METHOD

Meredith H. Fairchild, Whittier, Calif., assignor to TP Industrial, Inc., Lakewood, Calif.

Continuation-in-part of Ser. No. 402,778, Jul. 28, 1982, Pat. No. 4,434,069. This application Aug. 22, 1983, Ser. No. 526,019
The portion of the term of this patent subsequent to Feb. 28, 2001, has been disclaimed.
Int. Cl.³ C11D 1/78, 3/10, 7/12
U.S. Cl. 252—174.14 14 Claims

1. The process of cleaning a polycarbonate surface that includes

(a) washing the surface with a composition consisting essentially of an aqueous basic solution containing the members: alkali metal carbonate, alkali metal bi-carbonate and a mixture of mono and di esters of phosphoric acid,

(b) then rinsing the surface with water, and

(c) said members being in the relative weight percent proportions:

(i) between 84 and 91% alkali metal carbonate

(ii) between 8 and 12% alkali metal bi-carbonate

(iii) between 0.5 and 1.5% of said mixture of mono and di esters of phosphoric acid.

4,505,837

LIQUID CRYSTALLINE PHENYLCYCLOHEXENE DERIVATIVES

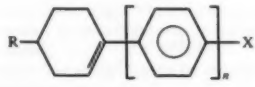
Michael Römer, Rodgau; Ludwig Pohl, Darmstadt, and Rudolf Eidenschink, Dieburg, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 236,351, Feb. 20, 1981, abandoned. This application Mar. 24, 1983, Ser. No. 478,424
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006666
Int. Cl.³ G09K 3/34; G02F 1/13; C07C 13/28, 21/24, 25/13, 43/21, 69/03, 121/75
U.S. Cl. 252—299.6 16 Claims

1. In an electrooptical display including a liquid crystalline material, the improvement wherein the liquid crystalline material comprises at least one compound of the formula

wherein n is 1 or 2, X is —H, —R, —OR, —OCOR, —OCOOR, —CF_3 or —F and R is alkyl of 1–8 C atoms and when two R groups are present they can be the same or different.

6. In a liquid crystalline dielectric comprising at least two liquid crystalline components, the improvement wherein at least one component is a compound of the formula



wherein n is 1 or 2, X is —H, —R, —OR, —OCOR, —OCOOR, —CF_3 or —F and R is alkyl of 1–8 C atoms and when two R groups are present they can be the same or different.

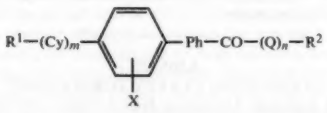
4,505,838

HALOGENOBIPHENYL DERIVATIVES

Michael Römer, Rodgau; Joachim Krause, Dieburg, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Mar. 4, 1983, Ser. No. 472,307
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208089
Int. Cl.³ C09K 3/34; G09F 9/35; C07C 49/813, 49/84, 69/76, 69/94
U.S. Cl. 252—299.63 11 Claims

1. A liquid crystal dielectric useful in electrooptical display elements, comprising at least two liquid crystal components, at least one component being an halogenobiphenyl compound of the formula



wherein R^1 and R^2 are each alkyl or alkoxy each of 1–10 C atoms; Cy is 1,4-cyclohexylene; Ph is 1,4-phenylene; Q is —O—Cy— or —O—Ph; m and n are each 0 or 1; and X is F, Cl or Br, with the proviso that when R^1 and R^2 are both alkoxy, and m and n are both 0, then X is not F or Cl.

4,505,839

POLYALKANOLAMINES

Thomas J. Bellos, Kirkwood, and Eva G. Lovett, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed May 18, 1981, Ser. No. 264,506
Int. Cl.³ B01D 17/04
U.S. Cl. 252—344 2 Claims

1. Compositions comprising quaternaries of polyalkanolamines which have an osmometer molecular weight of from about 325 to 525 and a viscosity of about 65 to 150 SUS when measured at 50% aqueous solution at 100° F., produced by the zinc chloride/acetic acid or aluminum sulfate/acetic acid catalyzed polymerization of alkanolamines, said quaternaries produced by the further reaction of said polyalkanolamines with an alkyl halide having 1 to 18 carbon atoms.

4,505,840

HETEROCYCLIC ELECTROACTIVE POLYMERS

Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 397,731, Jul. 13, 1982, abandoned. This application Nov. 17, 1982, Ser. No. 442,392
Int. Cl.³ H01B 1/00
U.S. Cl. 252—500 25 Claims

1. A tractible electroactive polymer which comprises a charged polymer backbone of diradical recurring units of a fused 5, 6-membered unsaturated ring system wherein the 5-membered ring contains at least one nitrogen and a second heteroatom selected from the group consisting of O, S, Se, Te, and substituted N, and a sufficient concentration of a charge-compensating ionic dopants associated therewith, wherein the polymer backbone is capable of undergoing a reversible oxidation or a reversible reduction or both to form said charged polymer backbone, and wherein the substituents for substituted N are selected from the group consisting of lower alkyl C_1–C_6, aryl, cycloalkyl, and alkoxy.

4,505,841

FUSED 6,6,6-MEMBERED HETEROCYCLIC ELECTROACTIVE POLYMERS

Peter Denisevich, Jr., El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 17, 1982, Ser. No. 442,393
Int. Cl.³ H01B 1/00
U.S. Cl. 252—500 20 Claims

1. A p-type electroactive polymer which comprises a charge polymer backbone of recurring units of a fused 6,6,6-membered unsaturated heterocyclic ring system wherein 6,6,6-membered unsaturated heterocyclic ring system connects into the polymer backbone through bonding in the outer carbocyclic rings, the central 6-member ring contains two heteroatoms para to each other, said heteroatoms selected from the group consisting of O, S, N, and substituted N, and a sufficient concentration of a charge-compensating anionic conductivity modifier associated therewith, wherein the polymer backbone is capable of undergoing reversible oxidation to form said charged polymer backbone.

4,505,842

HETEROAZOLE ELECTROACTIVE POLYMERS

Victor P. Kurkov, San Rafael; Albert H. Schroeder, Richmond; Peter Denisevich, Jr., El Cerrito, and Shigeto Suzuki, San Francisco, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 17, 1982, Ser. No. 442,397
Int. Cl.³ H01B 1/00
U.S. Cl. 252—500 24 Claims

1. A tractable electroactive polymer which comprises a charged polymer backbone of recurring units of a monocyclic 1,3-heteroazole, wherein the heteroatom is oxygen, sulfur, or substituted nitrogen, wherein the nitrogen is substituted with C_1–C_6 alkyl or phenyl, and a sufficient concentration of a charge-compensating ionic dopant associated therewith, wherein the polymer backbone is capable of undergoing reversible oxidation or reversible reduction or both to form the charged polymer backbone.

4,505,843

HETERODIAZOLE ELECTROACTIVE POLYMERS

Shigeto Suzuki, San Francisco; Victor P. Kurkov, San Rafael; Albert H. Schroeder, Richmond, and Peter Denisevich, Jr., El Cerrito, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 17, 1982, Ser. No. 442,399
Int. Cl.³ H01B 1/00
U.S. Cl. 252—500 23 Claims

1. A tractable electroactive polymer which comprises a charged polymer backbone of recurring units of a monocyclic 1,3,4-heterodiazole, wherein the heteroatom is oxygen or sulfur, and a sufficient concentration of a charge-compensating ionic dopant associated therewith, wherein the polymer backbone is capable of undergoing reversible oxidation or reversible reduction or both to form the charged polymer backbone.

4,505,844

P-TYPE POLYPHENOXAZINE ELECTROACTIVE POLYMERS

Peter Denisevich, Jr., El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 17, 1982, Ser. No. 442,400
Int. Cl.³ H01B 1/00
U.S. Cl. 252—500 20 Claims

1. A p-type electroactive polymer which comprises a charged polymer backbone of recurring units of a substituted or unsubstituted phenoxazine and a sufficient concentration of a charge-compensating anionic dopants associated therewith, wherein said polymer backbone is capable of undergoing reversible oxidation to said charged polymer backbone and said substituted phenoxazine contains from 1 to 3 substituents on the carbocyclic ring which links into the polymer backbone and from 1 to 4 substituents on the carbocyclic ring adjacent to the central ring containing the nitrogen atom which links into the polymer backbone wherein the substituents are independently selected from H; alkyl of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms; an alkylthio of 1 to 4 carbon atoms; a cycloaliphatic group of 5 or 6 carbon atoms; an aryl group of 6 to 10 carbon atoms; an aryl group of 6 to 10 carbon atoms substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms, alkoxy groups of 1 to 4 carbon atoms, 1 to 3 cyano groups, 1 to 3 halogen atoms, dialkylamino groups of 1 to 4 carbon atoms, an alkylthio of 1 to 4 carbon atoms; and a 5- or 6-membered nitrogen-containing unsaturated heterocyclic group.

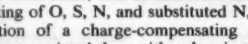
4,505,845

ELECTRICALLY CONDUCTING POLYMERS

David W. House, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

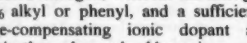
Continuation-in-part of Ser. No. 433,943, Oct. 12, 1982, Pat. No. 4,466,911. This application Jun. 11, 1984, Ser. No. 619,742
Int. Cl.³ H01B 1/00
U.S. Cl. 252—500 12 Claims

1. A method of preparing an electrically conducting solid polymeric composition comprising contacting a polymer whose repeating unit has the structure,



where A is an aromatic divalent moiety whose parent is selected from the group consisting of benzene, napthalene, anthracene, biphenyl, azobenzene, pyridine, acridine and stilbene with an effective amount, sufficient to increase electrical conductivity, of a p-type or n-type dopant and recovering the resulting doped polymer.

9. A method of preparing a solid polymer with the structure,



where A is an aromatic divalent moiety whose parent is selected from the group consisting of benzene, naphthalene, anthracene, biphenyl, pyridine, acridine, and stilbene, comprising reacting in solution approximately equimolar proportions of a 1,1,2,2-tetrahaloethane and an aromatic diamine selected from the group consisting of diaminobenzene, diaminonaphthalene, diaminoanthracene, diaminodiphenyl, diaminoazobenzene, diaminopyridine, diaminoacridine, and diaminostilbene, in a dipolar aprotic solvent in the presence of a base sufficient to remove formed acid and at a temperature from about 20° C. to about 100° C., and recovering the resulting polymer.

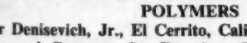
4,505,846

ELECTRICALLY CONDUCTING POLYMERS

David W. House, Arlington Heights, and Raymond J. Swedo, Mount Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 433,942, Oct. 12, 1982, Pat. No. 4,466,910. This application Jun. 11, 1984, Ser. No. 619,743
Int. Cl.³ H01B 1/00
U.S. Cl. 252—500 11 Claims

1. A method of preparing an electrically conducting solid polymeric composition comprising contacting a polymer whose repeating unit has the structure,



where Z is an aromatic divalent moiety whose parent is selected from the group consisting of benzene, naphthalene, anthracene, biphenyl, diphenylmethane, azobenzene, anthraquinone, pyridine, acridine and stilbene and Y is an aromatic divalent moiety whose parent is benzene with a p-type or n-type dopant in an amount sufficient to increase electrical conductivity and recovering the resulting doped polymer.

9. A method of preparing a solid polymer whose repeating unit has the structure,

$$(=CH-Y-CH=N-Z-N=)$$

where Z is an aromatic divalent moiety whose parent is selected from the group consisting of benzene, naphthalene, anthracene, biphenyl, diphenylmethane, azobenzene, anthaquinone, pyridine, acridine, and stilbene, and Y is an aromatic divalent moiety whose parent is benzene, comprising reacting in solution approximately equimolar proportions of an α,α,α'-,α'-tetrahaloxylene and an aromatic diamine selected from the group consisting of diaminobenzene, diaminonaphthalene, diaminoanthracene, diaminobiphenyl, diaminopyridine, diaminoacridine, diaminoanthraquinone, bis-(aminophenyl)methane, diaminoazobenzene, and diaminostilbene, in a dipolar aprotic solvent in the presence of a base in an amount sufficient to remove formed acid and at a temperature from about 20° C. to about 100° C., and recovering the resulting polymer.

4,505,847

ELECTRICALLY-CONDUCTIVE MATERIALS

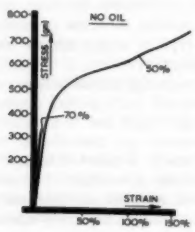
John Jackson, Lanark, Scotland, assignor to University of Strathclyde, Glasgow, Scotland

Filed Mar. 17, 1983, Ser. No. 476,324

Claims priority, application United Kingdom, Mar. 2, 1982, 8208229

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—511 **9 Claims**



1. An electrically-conductive material in which electrical resistivity is related to stress loading, which material comprises a homogeneous combination of a silicone rubber, graphitic carbon and a vegetable oil, the silicone rubber and vegetable oil together forming a unit volume of which the silicone rubber is present in the range 70–90% and the vegetable oil is present in the range 30–10%, the graphitic carbon being in particulate form and present in an amount of of grammes weight in the range 50–90% of the milliliter content of said unit volume, the arrangement being such that the material has an electrical resistivity not exceeding 500 ohm-meters for stress loadings not exceeding 500 gm/mm^2 the magnitude of resistivity change for a stress change of 500 gm/mm^2 being at least one ohm-meter.

4,505,848

SILICONE RUBBER MOLDED PRODUCTS AND A METHOD FOR PRODUCING SAME

Hideki Kobayashi, Ichihara, Japan, assignor to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Apr. 28, 1983, Ser. No. 489,443

Claims priority, application Japan, May 25, 1982, 57-89245

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—511 **18 Claims**

1. A molded article consisting essentially of (A) a cured conductive silicone rubber containing from 5 to 75 weight percent carbon black, said component being cured by an addition reaction in the presence of a platinum type catalyst, and (B) a cured insulating silicone rubber component containing substantially no carbon black and which is cured by from 0.2 to 5.0 weight percent of a non-aryl peroxide, wherein said conductive and insulating components form a unitary article.

4,505,849

POLYOL PRE-MIXTURE FOR MAKING FLAME-RETARDANT POLY-URETHANE FOAM PLASTICS

Horst Staendeke, Lohmar; Franz-Josef Dany, and Joachim Kandler, both of Erfstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 24, 1983, Ser. No. 469,466

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208693

Int. Cl.³ C09K *3/28*

U.S. Cl. 252—609 **3 Claims**

1. Storable polyol pre-mixture for making flame-retardant polyurethane foam plastics consisting essentially of ammonium polyphosphate, a mixture of polyols selected from the group of polyesterpolyols or polyetherpolyols, foam stabilizer, amine catalyst and expanding agent, wherein the ammonium polyphosphate has the general formula

$$H_{(n-m)+2}(NH_4)_mP_nO_{3n+1}$$

in which n stands for an average value of 100 to 1,000, m stands for a whole number of up to n+2 and m/n stands for a value of about 1, having an acid number of 0.01 to 5 mg KOH/g, containing 0.01 to 0.5 weight percent water and 0.5 to 15 weight percent water-soluble fractions in water at 25° C.

4,505,850

STABILIZERS FOR VINYL RESINS

Derek G. Pearson, Whitley Bay, England, assignor to Associated Lead Manufacturers Limited, Newcastle-upon-Tyne, England

Continuation of Ser. No. 434,254, Oct. 14, 1982, abandoned. This application Apr. 2, 1984, Ser. No. 594,953

Claims priority, application United Kingdom, Oct. 23, 1981, 8132058

Int. Cl.³ C09K *3/28*

U.S. Cl. 252—609 **8 Claims**

1. In a dibasic lead phosphite-containing stabilizer composition which can be mixed with vinyl resins so as to protect the vinyl resins against weathering, the improvement wherein said stabilizer composition includes 2 to 40% by weight, based on the total weight of the stabilizer composition, of an additive ingredient selected from the group consisting of hydroxides and hydrated oxides of aluminum, magnesium and antimony, and carbonates of calcium and magnesium, said additive ingredient functioning to reduce the danger of ignition of the dibasic lead phosphite and said stabilizer composition during manufacture, transport and storage and to reduce the fire propagation rate of said stabilizer composition to 100 mm/min or less.

4,505,851

PROCESS FOR SOLIDIFYING RADIOACTIVE WASTE PELLETS

Kiyomi Funabashi, Katsuta; Fumio Kawamura; Makoto Kikuchi, both of Hitachi, and Hideo Yusa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,293

Claims priority, application Japan, May 29, 1981, 56-80972

Int. Cl.³ G21F *9/16*

U.S. Cl. 252—628 **52 Claims**

1. A process for solidifying radioactive waste pellets comprising:

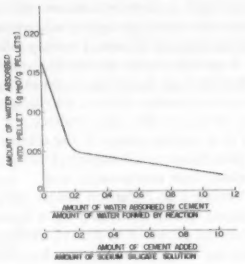
providing a container;

adding radioactive waste pellets to the container;

adding a liquid alkali silicate solution containing 40 to 80% by weight of water to the container;

adding a hardening agent to react with the alkali silicate solution to solidify the silicate and produce water; and

adding a water absorbent to absorb the produced water, wherein the ratio of the amount of water absorbed to the



amount of water formed is in the range of 0.2 to 1 thus producing a solid material having the radioactive pellets embedded therein.

4,505,852

7-AMINO-4-TRIFLUOROMETHYLQUINOLONE DERIVED SUBSTRATES AND METHOD FOR DETERMINING ENZYMES AND INHIBITORS

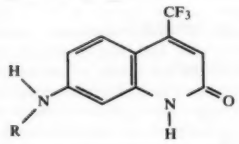
David W. Rasnick, Sunol, and Eugene R. Bissell, Alamo, both of Calif., assignors to Enzyme Systems Products, Dublin, Calif.

Filed Nov. 29, 1982, Ser. No. 445,280

Int. Cl.[3] **C07C** *103/52*

U.S. Cl. 260—112.5 R **20 Claims**

1. A synthetic substrate of the formula and its corresponding pharmaceutically acceptable salts



wherein R is a single amino acid or a peptide chain.

4,505,853

ENZYME-RESISTANT IMMUNOMODULATORY PEPTIDES

Gideon Goldstein, Short Hills; George Heavner, Flemington; Daniel Kroon, and Tapan Audhya, both of Bridgewater, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Nov. 18, 1983, Ser. No. 553,281

Int. Cl.[3] **C07C** *103/52;* **A61K** *37/00*

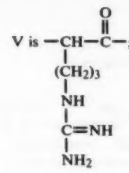
U.S. Cl. 260—112.5 R **28 Claims**

1. A peptide having the formula:

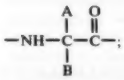
R—V—W—X—Y—Z—R^1

or a pharmaceutically acceptable acid- or base-addition salt thereof, wherein:

R is H, NH_2, acyl-NH, CH_3NH, or pyro-GLU-NH;

V is  ;

W is PRO, dehydro PRO, or



A individually is C_2–C_6 loweralkyl;

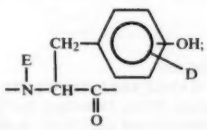
B individually is C_1–C_3 loweralkyl;

A and B taken together are —$(CH_2)_4$—or —$(CH_2)_5$—;

X is D-ASP, ASP, D-GLU, or GLU;

Y is GLY, VAL, LEU, nor-LEU, PHE, ILE, LYS, GLN, GLU, ALA, D-VAL, D-LEU, D- nor LEU, D-PHE, D-ILE, D-LYS, D-GLN, D-GLU, or D-ALA;

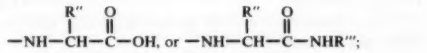
Z is



D is H or 1 or 2 substituents which increase or do not substantially decrease the acidity of the phenol proton;

E is H or C_1–C_3 loweralkyl;

R^1 is OH, NHR″,



and

R″ and R‴ are individually H or lower alkyl;

provided that V may be D- or L-isomer if R is other than H, and further provided that no more than one of V, X, and Y is a D amino acid.

4,505,854

OPTICALLY ACTIVE DIPEPTIDES AND THE USE THEREOF AS TISSUE DISSOLVING AND HISTOLYTIC AGENT IN HUMAN BEINGS

Jürgen Biedermann, Pulheim-Stommeln; Eugen Etschenberg, Cologne; Hugo Friehe, Erftstadt-Lechenich; Wolfgang Scheef, Bonn, and Johannes Winkelmann, Cologne, all of Fed. Rep. of Germany, assignors to Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

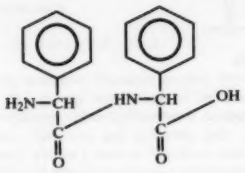
Continuation of Ser. No. 397,089, Jul. 12, 1982, abandoned. This application Jan. 5, 1984, Ser. No. 568,287

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1981, 3127930

Int. Cl.[3] **C07C** *103/52*

U.S. Cl. 260—112.5 R **2 Claims**

1. The optically active dipeptide D-2-phenylglycyl-D-2-phenylglycine of the formula I



I

and its pharmaceutically acceptable salts and acid addition salts.

4,505,855

TRANSPARENT NON-FIBRILIZED COLLAGEN MATERIAL BY ULTRACENTRIFUGATION

Romaine R. Bruns, Norwood, and Jerome Gross, Waban, both of Mass., assignors to Massachusetts General Hospital, Boston, Mass.

Filed Sep. 30, 1982, Ser. No. 431,578

Int. Cl.[3] **C07G** *7/00*; **A61B** *19/00*; **A61F** *1/16*

U.S. Cl. 260—123.7 **6 Claims**

1. A native, non-fibrilized, transparent collagen material formed from a soluble collagen solution by ultracentrifuging to form a pellet and fixing said pellet, said collagen material having less than 5% absorbance of light at 900 nm for a 5 mm thick sample.

4,505,856

AZO DYESTUFF DISCHARGEABLE TO WHITE

Ulrich Bühler, Schöneck; Joachim Ribka, Offenbach am Main-Bürgel; Horst Tappe, Dietzenbach, and Kurt Roth, Hofheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 386,916, Jun. 10, 1982, Pat. No. 4,406,661, which is a continuation of Ser. No. 268,128, May 28, 1981, abandoned. This application Jun. 10, 1983, Ser. No. 503,513

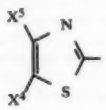
Int. Cl.[3] **C09B** *29/033, 29/039, 29/085, 29/09*

U.S. Cl. 534—753 **3 Claims**

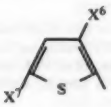
1. Azo dyestuff free from groups imparting solubility in water and having the formula

$$D—N=N—K—NHSO_2R$$

wherein D is the formula



or the formula



wherein

X^4 is nitro; cyano; alkylsulphonyl having 1 to 4 carbon atoms in the alkyl moiety; phenylsulphonyl; phenylsulphonyl substituted by methoxy, methyl, chloro, bromo or nitro; alkoxycarbonyl having 1 to 4 carbon atoms in the alkyl moiety; phenoxycarbonyl; or phenoxycarbonyl substituted in the phenyl moiety by alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, nitro, fluoro, chloro, or bromo;

X^5 is hydrogen; alkyl having 1 to 4 carbon atoms; phenyl; or phenyl substituted by alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, nitro or halogen;

X^6 is bromo; chloro; nitro; cyano; alkoxycarbonyl having 1 to 4 carbon atoms in the alkyl moiety; alkylcarbonyl having 1 to 4 carbon atoms in the alkyl moiety; or alkylsulphonyl having 1 to 4 carbon atoms in the alkyl moiety,

X^7 is nitro; cyano; bromo; chloro, alkylsulphonyl having 1 to 4 carbon atoms in the alkyl moiety; or alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy moiety;

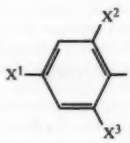
K is a 1,4-phenylene; a 1,4-naphthylene; a 2,5-thiazolylene; or a 2,5-thienylene component; and

R is alkyl having 1 to 8 carbon atoms; alkyl having 1 to 8 carbon atoms monosubstituted by a monosubstituent selected from the group of hydroxyl, chloro, bromo, cyano, alkoxy having 1 to 4 carbon atoms, hydroxyalkoxy having 1 to 4 carbon atoms, alkenoxy having 3 to 4 carbon atoms, cycloalkoxy having 5 to 6 carbon atoms, alkylcarbonyloxy having 2 to 4 carbon atoms, phenyl, phenoxy and benzoyloxy, with said phenyl, phenoxy and benzoyloxy being unsubstituted or substituted in the phenyl nucleus by alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, chloro, bromo or cyano; disubstituted alkyl having 1 to 8 carbon atoms substituted by hydroxyl and one of said monosubstituents; alkenyl having 2 to 4 carbon atoms; alkenyl having 2 to 4 carbon atoms substituted by hydroxyl, methoxy, ethoxy, chloro, bromo or cyano; phenyl; or phenyl substituted by alkyl having 1 to 4 carbon atoms, hydroxyalkyl having 1 to 4 carbon atoms, alkoxyalkyl having a total of 2 to 8 carbon atoms, hydroxyalkoxyalkyl having a total of 2 to 8 carbon atoms, alkanoyloxyalkyl having a total of 2 to 8 carbon atoms, alkoxy having 1 to 4 carbon atoms, hydroxyalkoxy having 1 to 4 carbon atoms, alkoxyalkoxyalkoxy having a total of 2 to 8 carbon atoms, hydroxyalkoxyalkoxy having a total of 2 to 8 carbon atoms, alkanoyloxyalkoxy having a total of 2 to 8 carbon atoms, chloro, bromo or nitro.

3. Azo dyestuff free from groups imparting solubility in water and having the formula

$$D—N=N—K—NHSO_2R$$

wherein D is the formula



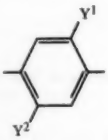
wherein

X^1 and X^2 independently of one another are each halogen; nitro; cyano; trifluoromethyl; alkyl having 1 to 4 carbon atoms; alkyl having 1 to 4 carbon atoms substituted by hydroxyl, methoxy, ethoxy, hydroxyethoxy, methoxyethoxy, ethoxyethoxy, chloro, bromo or cyano; alkylsulphonyl having 1 to 4 carbon atoms; alkoxysulphonyl having 1 to 4 carbon atoms substituted by hydroxyl, methoxy, ethoxy, hydroxyethoxy, methoxyethoxy, ethoxyethoxy, chloro, bromo or cyano; phenylsulphonyl; phenylsulphonyl substituted by methoxy, methyl, chloro, bromo or nitro; alkylcarbonyl having 1 to 4 carbon atoms in the alkyl moiety; alkylcarbonyl having 1 to 4 carbon atoms in the alkyl moiety substituted by hydroxyl, methoxy, ethoxy, hydroxyethoxy, methoxyethoxy, ethoxyethoxy, chloro, bromo or cyano; benzoyl; benzoyl with the phenyl moiety substituted by alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, nitro or halogen; alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy

moiety; alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy moiety substituted by phenyl, hydroxyl, alkoxy having 1 to 4 carbon atoms or alkylcarbonyloxy having 1 to 4 carbon atoms in the alkyl moiety; phenylazo; or phenylazo substituted by cyano, nitro, chloro, bromo, trifluoromethyl, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms or alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy moiety; and

X^3 is hydrogen or has one of the meanings of X^1;

K is the formula



wherein

Y^1 is hydrogen; halogen; alkyl having 1 to 4 carbon atoms; alkyl having 1 to 4 carbon atoms substituted by halogen, cyano, hydroxyl, alkanoyloxy having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms or alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy moiety; alkoxy having 1 to 4 carbon atoms; alkoxy having 1 to 4 carbon atoms monosubstituted by halogen, cyano, hydroxyl, alkoxy having 1 to 4 carbon atoms, hydroxyalkoxy having 1 to 4 carbon atoms, alkanoyloxy having 1 to 4 carbon atoms, or alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy moiety; or alkoxy having 1 to 4 carbon atoms disubstituted by two hydroxyls or by a hydroxyl and a chloro; and

Y^2 is alkylcarbonylamino having 1 to 4 carbon atoms in the alkyl moiety; alkylcarbonylamino having 1 to 4 carbon atoms in the alkyl substituted by chloro, bromo, hydroxyl, alkoxy having 1 to 4 carbon atoms, hydroxyalkoxy having 1 to 4 carbon atoms, alkanoyloxy having 1 to 4 carbon atoms, phenoxy or alkoxycarbonyl having 1 to 4 carbon atoms; benzoylamino; benzoylamino monosubstituted or disubstituted in the phenyl nucleus by hydroxyl, chloro, alkyl having 1 to 4 carbon atoms, or alkoxy having 1 to 4 carbon atoms; alkylsulphonylamino having 1 to 4 carbon atoms; alkylsulphonylamino having 1 to 4 carbon atoms; alkylsulphonylamino having 1 to 4 carbon atoms substituted by hydroxyl or alkoxy having 1 to 4 carbon atoms; phenylsulphonylalkylsulphonylamino having 1 to 4 carbon atoms substituted by hydroxyl or alkoxy having 1 to 4 carbon atoms; phenylsulphonylamino; phenylsulphonylamino monosubstituted or disubstituted in the phenyl nucleus by hydroxyl, chloro, alkyl having 1 to 4 carbon atoms, or alkoxy having 1 to 4 carbon atoms; or a moiety from the definition of Y^1; and

R is phenyl which can be trisubstituted, disubstituted or monosubstituted by methyl, ethyl, methoxy, ethoxy, chloro, bromo or nitro.

4,505,857

AZO COMPOUNDS HAVING A 5-SUBSTITUTED-4-CHLOROTHIAZOLYL-2-DIAZO COMPONENT RADICAL

Robert Egli, Rheinfelden, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Mar. 10, 1981, Ser. No. 242,506

Claims priority, application Switzerland, Mar. 13, 1980, 1981/80

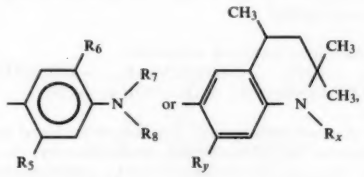
Int. Cl.[3] **C09B** *29/042, 29/09, 29/095;* **D06P** *1/18*

U.S. Cl. 534—768 **17 Claims**

1. A compound of the formula

wherein

K is the radical of a coupling component, said coupling component being 1-phenyl-3-methyl-5-aminopyrazole, 1-phenyl-3-methylpyrazolone-5,3-methylpyrazolone-5,1-(2′-hydroxyethyl)-3-methylpyrazolone-5,1-n-butyl-3-cyano-4-methyl-6-hydroxypyridone-2,1-methyl-2-phenylindole, 2-hydroxydiphenyl, p-cresol, 2-hydroxynaphthalene-3-carboxylic acid ethyl ester, 2-diethylamino-b 4-phenyl-1,3-thiazole, 2-benzylamino-3-cyano-4-methyl-6-(2′-hydroxyethyl)pyridine, 2,6-di-(n-butylamino)-3-cyano-4-methylpyridine, 2,6-di(3′-methoxypropylamino)-3-cyano-4-methylpyridine, 2-benzylamino-3-cyano-4,6-di-(methylamino)pyridine, 2,4,6-tri-(3′-methoxypropylamino)-3-cyanopyridine, 1-(N-cyanoethyl)naphthylamine or N-(3′-methoxypropylamino)-4-hydroxynaphthalimide,



wherein

R_5 is hydrogen; C_{1-2}alkyl; C_{1-2}alkoxy; cyano; formamido; (C_{1-4}alkyl)carbonylamino; (C_{1-4}alkyl)carbonylamino the alkyl moiety of which is monosubstituted by hydroxy, chloro, bromo, C_{1-4}alkoxy, phenyl, phenoxy, benzloxy or (C_{1-2}alkoxy)carbonyl; benzamido; acryloylamino; allylcarbonylamino; aminocarbonylamino; (C_{1-4}alkyl-)aminocarbonylamino; (C_{1-4}alkoxy)carbonylamino; (C_{1-4}alkoxy)carbonylamino the alkoxy moiety of which is monosubstituted by C_{1-2}alkoxy or phenyl; C_{1-2}alkylsulfonylamino; phenylsulfonylamino; di-(C_{1-2}alkyl-)aminosulfonylamino; chloro or bromo,

R_6 is hydrogen, chloro, bromo, C_{1-2}alkyl, C_{1-2}alkoxy or (C_{1-2}alkoxy)ethoxy, with the proviso that not more than one of R_5 and R_6 is chloro or bromo,

R_7 is hydrogen; C_{1-8}alkyl; C_{1-4}alkyl substituted by 1 or 2 substituents each of which is independently chloro, bromo, hydroxy, thiocyano, cyano, (C_{1-4}alkyl)carbonyl, (C_{1-4}alkoxy)carbonyl, formyloxy, (C_{1-10}alkyl)carbonyloxy, cyclohexyl, (C_{1-3}chloroalkyl)carbonyloxy, (C_{1-3}bromoalkyl)carbonyloxy, (C_{1-10}alkoxy)carbonyloxy, (C_{1-2}alkoxy)ethoxycarbonyloxy, (C_{3-4}alkenyl-)oxycarbonyl, chloroallyloxycarbonyl, bromoallyloxycarbonyl, C_{3-4}alkenyloxy, chloroallyloxy, bromoallyloxy, propynyloxy, benzoyloxy, C_{1-4}alkoxy, phenyl, phenoxy or phenyl(C_{1-4}alkoxy), with the proviso that not more than one substituent is a member of the group consisting of benzoyloxy, phenyl, phenoxy and and phenyl(C_{1-4}alkoxy); (C_{1-4}alkoxy)C_{1-4}alkyl the alkoxy moiety of which is monosubstituted by chloro, bromo, cyano, C_{1-4}alkoxy, (C_{1-4}alkoxy)carbonyl, (C_{1-4}alkoxy)carbonyloxy or (C_{1-4}alkyl)carbonyloxy; C_{3-4}alkenyl; C_{3-4}alkenyl monosubstituted by phenyl, chloro or bromo; propynyl; C_{5-7}cycloalkyl; cyclohexyl substituted by 1, 2 or 3 methyl groups; phenyl or phenyl substituted by 1, 2 or 3 substituents each of which is independently chloro, bromo, methyl or C_{1-2}alkoxy,

R_8 is hydrogen; C_{1-8}alkyl; C_{1-4}alkyl monosubstituted by chloro, bromo, hydroxy, cyano, thiocyano, (C_{1-4}alkyl)-carbonyl, (C_{1-4}alkoxy)carbonyl, formyloxy, (C_{1-4}alkyl)-

carbonyloxy, (C_{1-4}chloroalkyl)carbonyloxy, (C_{1-4}bromoalkyl)carbonyloxy, (C_{1-4}alkoxy)carbonyloxy, (C_{1-2}alkoxy)ethoxycarbonyloxy, (C_{3-4}alkenyl)oxycarbonyl, chloroallyloxycarbonyl, bromoallyloxycarbonyl, C_{3-4}alkenyloxy, chloroallyloxy, bromoallyloxy, propynyloxy, benzoyloxy, C_{1-4}alkoxy, phenyl, phenoxy, phenyl(C_{1-4}alkoxy), carbamoyl, (C_{1-4}alkyl)carbamoyl, di-(C_{1-4}alkyl)carbamoyl, (C_{1-4}alkyl)carbamoyloxy, di-(C_{1-4}alkyl)carbamoyloxy, phenylcarbamoyl, phenylcarbamoyloxy, phthalimidyl-2, succinimidyl-2, saccharinyl-2, pyridyl or benzothiazolyl-2-mercapto; (C_{1-4}alkoxy)C_{1-4}alkyl the alkoxy moiety of which is monosubstituted by chloro, bromo, cyano, C_{1-4}alkoxy, (C_{1-4}alkoxy)carbonyl, (C_{1-4}alkoxy)carbonyloxy or (C_{1-4}alkyl)carbonyloxy; 2-hydroxy, (C_{1-4}alkyl)carbonyloxy or (C_{3-4}alkenyl)carbonyloxy-3-allyloxypropyl; 2-hydroxy, (C_{1-4}alkyl)carbonyloxy or (C_{3-4}alkenyl)carbonyloxy-3-propynyloxypropyl; C_{3-4}alkenyl or C_{3-4}alkenyl monosubstituted by chloro, bromo or phenyl, or

R_7 and R_8 taken together and with the nitrogen atom to which they are joined are piperidino or morpholino,

R_x is hydroxyethyl, methyl, ethyl, methoxycarbonylethyl, ethoxycarbonylethyl, benzyl, methoxyethyl, ethoxyethyl or acetoxyethyl,

and

R_y is hydrogen, methyl or acetamido,

R is —CHO, —CH=C(CN)—R_1, —CH=CH—R_2, —CH=C(NO_2)—R_3, —CH=NOH or —CN,

wherein

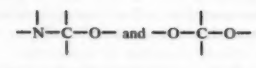
R_1 is (C_{1-10}alkoxy)carbonyl; (C_{1-10}alkoxy)carbonyl monosubstituted by chloro, bromo, cyano, hydroxy, C_{1-2}alkoxy, (C_{1-2}alkyl)carbonyloxy or (C_{1-2}alkoxy)carbonyl; (C_{1-10}alkoxy)carbonyl disubstituted by hydroxy and by chloro or bromo; (C_{3-8}alkenyl)oxycarbonyl; (C_{3-8}chloroalkenyl)oxycarbonyl; (C_{3-8}bromoalkenyl)oxycarbonyl; propynyloxycarbonyl; benzyloxycarbonyl; chlorobenzyloxycarbonyl; nitrobenzyloxycarbonyl; C_{1-4}alkylsulfonyl; phenylsulfonyl; tolylsulfonyl; carbamoyl; (C_{1-2}alkyl)carbamoyl; di-(C_{1-2}alkyl)carbamoyl; phenylcarbamoyl; aminothiocarbonyl; benzimidazolyl-2; cyano; acetyl; phenyl; benzoyl or phenyl or benzoyl substituted by 1, 2 or 3 substituents each of which is independently chloro, bromo or nitro, with the proviso that the maximum number of nitro groups is two, and

R_2 is phenyl; benzoyl or phenyl or benzoyl substituted by 1, 2 or 3 substituents each of which is independently chloro, bromo or nitro, with the proviso that the maximum number of nitro groups is two, and

R_3 is hydrogen, methyl or ethyl, and

m is 0 or 1,

with the provisos that (i) when R is —CN, m must be 1, and (ii) the molecule is free of



radicals.

4,505,858

PROCESS FOR PRODUCING 3,4,9,10-TETRATHIOPERYLENE AND 3,4,9,10-TETRASELENOPERYLENE

Carl W. Mayer, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 30, 1983, Ser. No. 538,022

Claims priority, application Switzerland, Oct. 12, 1982, 5962/82

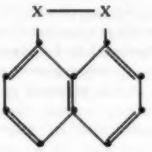
Int. Cl.[3] **C07D** *9/00, 333/00*

U.S. Cl. 260—239 R **7 Claims**

1. A process for producing chalcogen-substituted perylenes of the formula I

(I)

wherein X is S or Se, which process comprises heating a compound of the formula II



(II)

wherein X has the meaning defined under the formula I, in nitrobenzene, or in a mixture of nitrobenzene and an organic solvent miscible therewith and inert under the reaction conditions, in the presence of a Lewis acid or a protonic acid at 20° to 120° C.

4,505,859

PREPARATION OF 2-HALOETHYLAMIDES

Graham S. Poindexter, Evansville, Ind., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 9, 1981, Ser. No. 309,961

Int. Cl.[3] **C07C** *118/00, 102/00*

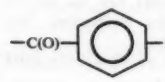
U.S. Cl. 260—453 P **5 Claims**

1. A process for preparing haloalkylamides of the formula $XCH_2CR_2N(R)_nR'$ where:

X is chloro, bromo or iodo;

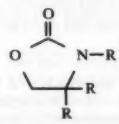
R is hydrogen, C_{1-6} alkyl or phenyl;

n is zero or one; and when n is one, R' is selected from the group consisting of R''C(O)—, R'''SO_2—, R'''S(O)—, R'''S—, $(C_6H_5)_2NC(O)$—, N≡C—, $(R'''O)_2P(O)$— and



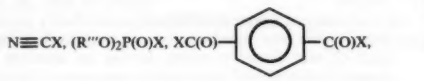
where R'' is alkyl, haloalkyl, aryl, aralkyl, aryloxy or arylthio of up to 20 carbons; and R''' is C_{1-6} alkyl, haloalkyl or phenyl; and

when n is zero, R' is O=C= or O=S=, comprising reacting 2-oxazolidinone or a C_{1-6} alkyl or phenyl derivative thereof of the formula



where R is as previously defined, with an acid halide of the formula:

$R''C(O)X$, $R'''SO_2X$, $R'''S(O)X$, $R'''SX$, $(C_6H_5)_2NC(O)X$,



$C(O)X_2$ or $S(O)X_2$

where R'', R''' and X are as previously defined at an elevated temperature, so as to prepare the haloalkylamide.

4,505,860

CYCLIC KETO-BUTYRALDEHYDES A PROCESS FOR THEIR PREPARATION, AND THEIR USE IN THE PREPARATION OF CYCLIC DIISOCYANATES

Gerhard Klein, Monheim; Dieter Arlt, Cologne, and Rudolf Braden, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

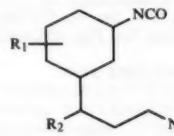
Filed Aug. 23, 1982, Ser. No. 410,791

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135948

Int. Cl.[3] **C07C** *69/00;* **C08G** *18/00, 18/10*

U.S. Cl. 260—453 A **2 Claims**

1. A diisocyanate of the formula (IV)



(IV)

in which

R_1 and R_2 are identical or different and denote hydrogen or lower alkyl and in which the cycloaliphatic ring can contain a double bond.

4,505,861

METHODS AND INTERMEDIATES FOR THE PREPARATION OF SPERMIDINE, HOMOSPERMIDINE AND NORSPERMIDINE

Raymond J. Bergeron, Jr., Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed Jul. 23, 1982, Ser. No. 401,387

Int. Cl.[3] **C07C** *121/50, 85/12*

U.S. Cl. 260—465 E **5 Claims**

1. A method for the preparation of spermidine, homospermidine or norspermidine comprising hydrogenating a member selected from the group consisting of 4-benzyl-4-azaoctanedinitrile, 5-benzyl-5-azanonanedinitrile and 4-benzyl-4-azaheptanedinitrile in the presence of a catalytic amount of a noble metal containing hydrogenation catalyst and an acid.

4,505,862

DIPHENYDRAMINE DIHYDROGENCITRATE

Harold Sheinaus, Watchung, and Arnold D. Marcus, Livingston, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 254,036, Apr. 14, 1981, Pat. No. 4,401,665. This application Sep. 13, 1982, Ser. No. 417,820

Int. Cl.[3] **C07C** *97/10*

U.S. Cl. 260—501.18 **1 Claim**

1. Diphenhydramine dihydrogencitrate.

4,505,863

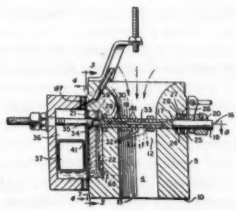
CARBURETOR

Arthur J. Smith, P.O. Box 96, Donnelly, Id. 83615

Continuation-in-part of Ser. No. 376,108, May 7, 1982, abandoned, which is a continuation of Ser. No. 178,579, Aug. 15, 1980, abandoned. This application Nov. 4, 1983, Ser. No. 548,700

Int. Cl.[3] **F02M** *7/22*

U.S. Cl. 261—34 A **7 Claims**



1. A carburetor including, a main body having a vertical throat therethrough and a plurality of side faces, a pivotal shaft having an axial bore and extending through said body from one said side face to an opposite one of said side faces and bisecting said throat, a throttle plate carried by said shaft in said throat, fuel jets through said shaft and throttle plate, said body opposite side face provided with a recessed fuel metering chamber having an inner wall, the periphery of said metering chamber having a recessed shoulder adjacent said body opposite side face, a fuel metering pendulum within said chamber having a head affixed to one end of said shaft, said chamber including a bottom wall of fixed radius curvature, a foot on said pendulum having a bottom surface of substantial extent providing a close mating sliding fit with said chamber bottom wall, said pendulum including a planar outside face and an opposite planar inner face juxtaposed said chamber inner wall to provide a semi-seal therebetween without frictional engagement, a leading face and opposite trailing face bounding said outside and inner face, said inner wall provided with an arcuate variably cross-sectioned groove juxtaposed said pendulum foot inner face, a valved plate overlying said chamber and providing a substantial fluid seal with said pendulum outside face, said valved plate disposed within said metering chamber recessed shoulder with its outer surface flush with said body opposite side face, a plate sealing member overlying said body opposite side face and having a central opening communicating with said plate, said sealing member opening provided with an inner periphery overlying the periphery of said plate, said pendulum having an internal primary fuel passageway communicating between said foot inner face juxtaposed said groove and said head to transmit variable amounts of fuel from said chamber groove to said pivotal shaft bore, said primary passageway at said inner face including a separate seal element carried by said foot and constantly engageable with said chamber inner wall on opposite sides of said groove, said seal element including a bore allowing transmission of fuel from said chamber groove

through said primary passageway to said pivotal shaft bore, said pendulum leading face having an enlarged recess extending vertically from said foot to the intermediate portion of the height of said pendulum, said recess extending laterally from said outside face to a line intermediate the transverse depth of said pendulum, a by-pass fuel passageway in said pendulum having an inlet communicating with said recess and an outlet juxtaposed said groove intermediate said primary passageway and said trailing face whereby, swinging of said pendulum in the direction of said leading face forces fuel entrapped within said recess through said by-pass passageway.

6. A carburetor including, a main body having a vertical throat therethrough and a plurality of side faces, said main body comprising a block of metal having a total horizontal thickness of metal through the center of said throat substantially exceeding the diameter of said throat, said main body having a height substantially equal to its width, the radial thickness of said main body from said throat to the exterior of said main body being substantially greater than the radius of said throat, a pivotal shaft having an axial bore and extending through said body from said side face to an opposite one of said side faces and bisecting said throat, a throttle plate carried by said shaft in said throat, said body opposite side face provided with a recessed fuel metering chamber having an inner wall, a fuel metering pendulum within said chamber having a head affixed to one end of said shaft, said chamber including a bottom wall of fixed radius curvature, a foot on said pendulum having a bottom surface of substantial extent providing a close mating sliding fit with said chamber bottom wall, said pendulum including a planar inner face juxtaposed said chamber inner wall to provide a semi-seal therebetwcen, said inner wall provided with an arcuate variably cross-sectioned groove juxtaposed said pendulum foot inner face, said pendulum having an internal fuel passageway communicating between said foot inner face juxtaposed said groove and said head to transmit variable amounts of fuel from said chamber groove to said pivotal shaft bore, said passageway at said inner face constantly engageable with said chamber inner wall on opposite sides of said groove thereby allowing transmission of fuel from said chamber groove through said pendulum passageway to said pivotal shaft bore, a float body comprising a block of metal substantially fully overlying said opposite one of said main body side faces, and said main body and float body metal comprises aluminum.

4,505,864

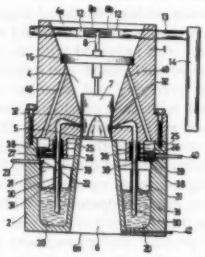
DEVICE FOR CARBURETTING AIR AND FUEL

Yu-Ting Chang, No. 53, Lane 46, Chung Shan E Rd., Fong-Shan City Kaohsiung Hsieng, Taiwan

Filed Jun. 29, 1983, Ser. No. 509,083

Int. Cl.³ F02M *7/24*

U.S. Cl. 261—40 **1 Claim**



1. A device for carburetting air and a hydrocarbon fuel, comprising:

(a) a housing (1, 2) having a wall defining a main air passage having a converging portion (4), a throat portion (5) and a diverging portion (6), said converging portion having one end forming a main air inlet (4*a*), said diverging portion having one end forming a fuel-air mixture outlet (6*a*);

(b) means for regulating the air flow at said main air inlet including a throttle plug (7) for blocking said throat portion, means (8, 9) for holding said plug, and means (11–14) for operating said holding means to lift and lower said plug to control the rate of air flow at said throat portion;

(c) an annular fuel receiving chamber (20) defined in the wall of said housing around said diverging portion and having a float member (21);

(d) means (23) for supplying fuel into said chamber;

(e) valve means (22) for interrupting the fuel supply when said float member is raised to a certain level;

(f) a plurality of tube members (30) for sucking fuel from said chamber and delivering it at said throat portion, each of said tube members having a lower portion extending into the fuel through said float member and having an upper portion provided with a nozzle member (32) directed toward said throat portion, a wall of each tube member being provided with openings (35) for admitting air therein;

(g) a plurality of sleeve members (36) individually provided around said tube members for covering said openings, each of said sleeve members having an aperture (37) shaped to expose said openings in a sequence of from one to all openings upon the angular rotation of said sleeve member;

(h) means for controlling the angular rotation of said sleeve members, said means including a conduit (42) communicating with said fuel-air mixture outlet and extending outwardly of said housing, a bellows member (43) connected with said conduit for sensing the presence developed in said fuel-air mixture outlet, an actuating rod (45) connected to said bellows member, and a ring member 29 provided around and connected to said sleeve members and said actuating rod; and

(i) pilot air inlet means (49) branching off said main air passage and provided in the wall of said housing, said pilot air inlet means communicating said converging portion and said openings of said tube means.

4,505,865

STEAM-PRESSURE REDUCTION VALVE

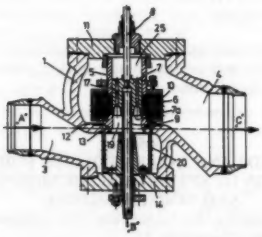
Kurt Wüllenkord, Bielefeld, Fed. Rep. of Germany, assignor to Holter Regelarmaturen GmbH & Co. Kg, Scholss Holte-Stukenbrock, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,736

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304523

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—44 R **14 Claims**



1. In a steam-pressure reduction valve for cooling steam and for reducing its pressure and having a valve housing with an intake for the hot steam and an outlet for the cooled and pressure-reduced steam and adjustable control means comprising a cold-water pipe and cold-water exits positioned between the intake and the outlet for determining the cross-section of the steam passage, the improvement wherein the control means

comprises: choking means mounted coaxially around the cold-water pipe and inside the valve housing and having reduction bores therein and a control piston mounted coaxially around the cold-water pipe inside the choking means for continuous movement and having a control surface for simultaneously releasing the cold-water exits in the cold-water pipe and the jacket-side reduction bores in the choking means in accordance with load, whereby load-dependent cooling and pressure reduction of the steam in the high steam-pressure range is obtained.

4,505,866

PROCESS FOR PRODUCING A BOEHMITE SHAPED PRODUCT AND A BURNED BOEHMITE SHAPED PRODUCT

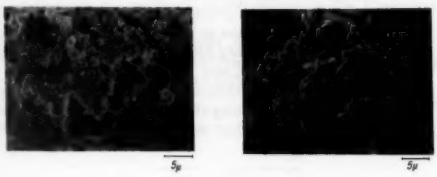
Yasuo Oguri, Tokyo; Junji Saito, Yokohama, and Naoto Kijima, Machida, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Feb. 15, 1983, Ser. No. 466,576

Claims priority, application Japan, Feb. 23, 1982, 57-28008; Oct. 29, 1982, 57-190074

Int. Cl.³ C04B *35/52*

U.S. Cl. 264—42 **10 Claims**



1. A process for producing a foamed boehmite shaped product which comprises:

A. preparing a foamed slurry comprising:

1. a gibbsite powder
2. at least one additional powder selected from the group consisting of pseudo-boehmite, amorphous aluminum hydroxide, alumina cement and ρ-alumina,
3. a thickener, and
4. water;

B. molding the foamed slurry thereby obtained and

C. subjecting the foamed molded product to hydrothermal treatment.

4,505,867

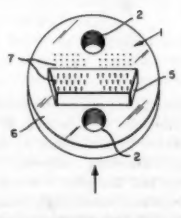
PROCESS FOR POLYESTER YARNS

Michael E. Mirhej, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 347,926, Feb. 11, 1982, abandoned. This application Aug. 3, 1983, Ser. No. 520,008

Int. Cl.³ B29F *3/08*

U.S. Cl. 264—103 **19 Claims**



1. Improvement in a melt-spinning process for preparing a mixed multifilament polyester yarn from a copolymer of poly(ethylene terephthalate) and about 2 mol % ethylene 5(sodium-sulfo)isophthalate units, the improvement characterized by melt-spinning part of the copolymer through a first set of spinneret capillaries whose cross sections have no more than one axis of symmetry and melt-spinning the remainder of the copolymer through a second set of spinneret capillaries that are recessed in relation to those of the first set and whose cross sections have a plurality of axes of symmetry, and by directing a stream of quenching air to strike filaments (a) that have emerged from the first set before filaments (b) that have emerged from the second set, whereby filaments (a) have no more than one axis of planar symmetry and a nonuniform orientation profile across their cross section as shown by birefringence and have a tenacity of 0.8 to 2.0 grams per denier, and filaments (b) have a plurality of axes of planar symmetry, a tenacity of 1.6 to 3.6 grams per denier, and said tenacity is 30 to 200% higher than that of filaments (a), and an elongation at break at least 30% higher than that of filaments (a).

4,505,868

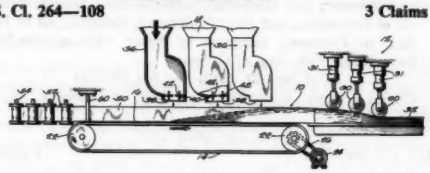
APPARATUS FOR FORMING MAT OF ALIGNED FLAKE COMPOSITE WOOD MATERIAL WITH CONTINUOUS BAFFLES

Gordon P. Krueger, Hancock; Anders E. Lund, and Roy D. Adams, both of Houghton, all of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

Continuation of Ser. No. 365,622, Apr. 1, 1982, abandoned. This application Jun. 19, 1984, Ser. No. 621,886

Int. Cl.³ B29D *3/02*

U.S. Cl. 264—108 **3 Claims**



3. A method for compressing a continuous loosely felted mat of wood flakes into a composite wood sheet, the mat being elongated and including a longitudinal axis, and the wood flakes being elongated and being aligned in mutually parallel relation and parallel to the longitudinal axis of the continuous mat, the method comprising the steps of:

providing a conveyor having an upper surface adapted to support a loosely felted mat of wood flakes thereon, and means for causing continuous movement of the conveyor as the loosely felted mat is formed.

depositing wood flakes on the upper surface of the conveyor such that the wood flakes are built up on the upper surface to form an elongated continuous loosely felted mat,

providing a plurality of elongated lengths of baffle material for causing the wood flakes deposited on the upper surface of the conveyor to assume an orientation parallel to the direction of movement of the conveyor and for maintaining the parallel orientation of the wood flakes as the mat thickness increases, the elongated lengths of baffle material being oriented so as to define parallel adjacent vertical planes parallel to the direction of movement of the upper surface of the conveyor, the lengths of baffle material being positioned in closely spaced side-by-side parallel relation and being supported so as to move continuously and in one direction with the upper surface of the conveyor as the loosely felted mat is formed, with each length of baffle material including a lower edge positioned immediately adjacent the upper surface of the conveyor, and

compressing the loosely felted mat of wood flakes and the baffle material to form a composite wood sheet.

4,505,869

METHOD FOR MANUFACTURING WOOD-LIKE MOLDED PRODUCT

Sadao Nishibori, 1-9, 1-Chome, Higashishinagawa, Shinagawa-Ku, Tokyo, Japan

Filed Feb. 22, 1983, Ser. No. 468,650
Claims priority, application Japan, Mar. 3, 1982, 57-33436; Apr. 30, 1982, 57-72669; Apr. 30, 1982, 57-72671
Int. Cl.[3] B01J 2/20
U.S. Cl. 264—115 12 Claims

A method of manufacturing a shaped, synthetic wood-like product comprising sequentially:

preparing an aggregate by mixing dry wood meal with a thermosetting area resin, heating the mixture at a temperature of about 100–170° C until the resin is set, to form aggregate having a particle size of 100 mesh or more;

reducing the water content of said aggregate to less then 5%, and maintaining said reduced water content during manufacturing;

reducing possibility of formation, dissociation or volatilization of wood vinegar or acid gases by said reduced water content and neutralization of said aggregate with urea resin;

mixing said aggregate with a thermoplastic resin binder; and

heat molding said aggregate/binder mixture into a desired shape.

4,505,870

PREPARATION OF LOW RESIDUAL SOLVENT CONTENT POLYACRYLONITRILE FILAMENTS

Ulrich Reinehr; Toni Herbertz; Hermann-Josef Jungverdorben, all of Dormagen, and Hans Uhlemann, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,514
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1982, 3225267
Int. Cl.[3] D01F 6/18
U.S. Cl. 264—206 3 Claims

1. A dry-spinning process for preparing polyacrylonitrile filaments which contain at least 45% by weight of acrylonitrile units and have a residual solvent content of less than 5% by weight in a total linear density of over 100,000 dtex without contact with an extracting agent for the spinning solvent, characterized in that:

(a) the spinning solution spun has a viscosity at 100° C. of 10 to 60 falling-ball seconds,

(b) the filaments are treated while still hot, directly at the end of the spinning cell, inside it or immediately outside the end of the spinning cell, with a spin-finish which contains a lubricant and an antistat and which gives the filaments a moisture content of at most 10% by weight, relative to the solids content of the fiber, and

(c) the filaments are immediately exposed to heat treatment without cooling down first, said process further characterized in that the filaments are continuously dry-spun, the so spun filaments are while still hot continuously treated with said spin-finish and the resultant so treated filaments are continuously immediately exposed to a heat treatment without cooling down first.

4,505,871

METHOD FOR MANUFACTURING AN OBJECT OF SILICON NITRIDE

Jan Adlerborn; Hans Larker, and Jan Nilsson, all of Robertsfors, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Continuation of Ser. No. 259,155, Apr. 30, 1981, abandoned, which is a continuation of Ser. No. 034,509, Apr. 30, 1979, abandoned. This application Aug. 22, 1983, Ser. No. 525,263
Claims priority, application Sweden, May 2, 1978, 7804990
Int. Cl.[3] B22F 3/14
U.S. Cl. 264—325 10 Claims

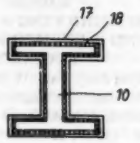
1. A method for manufacturing an object of silicon nitride utilizing isostatic pressing with a gaseous pressure medium, said method comprising:

providing a body preformed from silicon nitride powder and having pores containing a gas;

forming a casing on said body, said casing initially being gas-permeable to permit flow of gas therethrough and being capable of being transformed into a gas-impermeable condition upon heating to a transformation temperature level;

surrounding the encased body with a gaseous environment;

transforming the initially gas-permeable casing into a gas-



impermeable condition by heating the same in said environment to a transformation temperature level;

preventing the departure of gas from the pores of said body and through the casing during said transformation by maintaining the pressure of said surrounding environment during said transformation at a level which is at least as great as the simultaneously prevailing pressure of the gas in the pores of the body; and

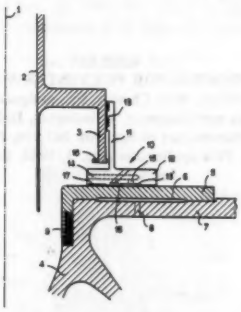
isostatically pressing and sintering the preformed body in said gas-impermeable casing at another pressure level that is substantially greater than said first mentioned pressure level.

4,505,872

COMPONENT FOR CONNECTING A PRIMARY PUMP AND A DELIVERY PIPE IN A BREEDER REACTOR OF THE SWIMMING-POOL TYPE

N. Delloye, Jeumont, France, assignor to Jeumont-Schneider, Puteaux, France

Filed Feb. 8, 1982, Ser. No. 346,401
Claims priority, application France, Feb. 9, 1981, 81 02456
Int. Cl.[3] G21D 1/04
U.S. Cl. 376—203 2 Claims



1. In a liquid metal-cooled pool-type breeder reactor having a primary pump connected to a source of liquid metal and a delivery pipe connected to said pump by means of a connecting component, said connecting component being free to move relative to the pump and the pipe while providing adequate sealing between low pressure and high pressure sections of the pump and permitting limited relative movement to occur between the pump and the pipe radially, axially, and angularly, said connecting component having, in combination, a cylindrical sleeve substantially coaxial with the delivery pipe in a

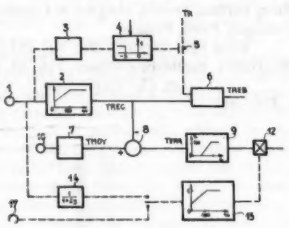
resting position, a cylindrical guide secured to the pump parallel to the sleeve and extending into the sleeve with sufficient clearance therebetween to permit said angular movement, a sealing joint disposed between the sleeve and the guide and permitting said axial and angular movements, an annular collar attached to the sleeve and resting upon an annular rim connected to an upper end of the pipe, hydrostatic thrust block means including first socket means disposed within a lower surface of the collar and connected by sprayer and duct means to the high pressure section of the pump so as to receive fluid discharged from the pump and including second socket means disposed within the lower surface of said collar, said first and second socket means being connected by a leakage flowpath, said second socket means being connected to further duct means for conducting that fluid into a low pressure region leading to the pump, and a sealing joint disposed at said lower surface of the collar and providing sealing between the high pressure section of the pump and said further duct means.

4,505,873

METHOD FOR REGULATING THE POWER SUPPLIED TO A STEAM TURBINE/PRESSURIZED WATER NUCLEAR REACTOR

Jean-Francois Petetrot, Paris, France, and Pierre Parent, Champaign, Ill., assignors to Framatome & Cie, Courbevoie, France

Filed Apr. 3, 1981, Ser. No. 235,878
Claims priority, application France, Feb. 15, 1980, 80 03433
Int. Cl.³ G21C *7/36*
U.S. Cl. 376—216 **5 Claims**



1. Method for regulating the power supplied to a steam turbine by a pressurized water nuclear reactor driving an electrical generator feeding a network, by displacements of the neutron-absorbing control rods in the core of said reactor, and by by-passing a fraction of the steam produced by said reactor out from the turbine circuit by opening by-pass valves, the displacement of said control rods being determined as a function of a parameter homogeneous with a reference temperature, formed from a signal representing the load on said turbine, the opening of said by-pass being determined by the difference between said reference temperature and the actual average temperature in the primary circuit of said reactor, said method comprising the steps of

(a) automatically detecting the eventual occurrence of very rapid and large amplitude variation of the load on said turbine, of the type occurring upon uncoupling of said generator and said network, or load rejection;

(b) upon detection of such load variation, selecting the parameter determining the position of said control rods as the larger of two values of said reference temperature, one of said values being the reference temperature determined from said signal representing the load on said turbine, the other of said values being a predetermined temperature defining a power level of said reactor sufficiently high to permit automatic control of the power of said reactor through said control rods;

(c) modifying the opening signal for said by-pass valves by a gain signal determined from a signal determined from a signal representing the power level, to attenuate the effects of variations in temperature in said reactor, on the signal for opening said valves; and

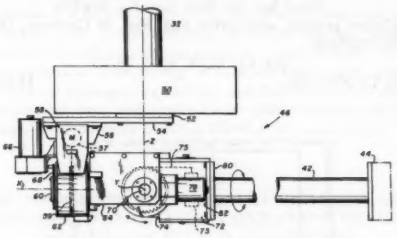
(d) maintaining control of the opening of said by-pass valves by the modified opening signal.

4,505,874

VESSEL INSPECTION BOOM

Douglas H. Warren, West Springfield, Mass., and Timothy H. Wentzell, South Windsor, Conn., assignors to Combustion Engineering Co., Inc., Windsor, Conn.

Filed Mar. 8, 1982, Ser. No. 355,617
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—249 **6 Claims**



1. In apparatus for the non-destructive testing of the wall of a nuclear reactor pressure vessel, the pressure vessel having a hemispherically shaped lower head portion and a cylindrical portion extending therefrom, the apparatus including a transducer mounted on the end of a support arm so as to be juxtapositioned to the inner surface of the vessel wall, the apparatus further including an elongated boom and means for supporting said boom co-axially with the pressure vessel cylindrical portion, the boom extending into the vessel from an exterior location, improved means for coupling the transducer support arm to the boom comprising:

first articulated joint means, said first joint means including first and second housing means which are relatively rotatable about a first pivot axis, said first pivot axis being intersected by an extension of the boom axis, the boom axis extension and first pivot axis defining a first plane;

means affixing the first of said joint means housing means to a first end of the support arm whereby the support arm will move with said first joint means first housing means;

second articulated joint means, said second joint means including first and second housing means which are relatively rotatable about a second pivot axis, said second pivot axis being transverse to and intersecting both said first pivot axis and the boom axis, said second axis being offset from the axis of the boom, said first and second pivot axes defining a second plane which is transverse to said first plane, said second pivot axis and the boom axis defining a third plane which is transverse to each of said first and second planes;

means affixing the second of said first joint means housing means to the first of said second joint means housing means whereby said first joint means will move with said second joint means first housing means;

means for rotatably coupling said second joint means housing means to the boom whereby said interconnected first and second joint means may be caused to rotate as a unit about the axis of the boom;

first motor means mounted within one of said first joint means housing means, said first motor means producing relative rotation between said first joint means first and second housing means;

second motor means mounted within one of said second joint means housing means, said second motor means producing relative rotation between said second joint means first and second housing means independently of rotation between said first joint means housing means; and

position sensor means for continuously monitoring the angular relation between each of said joint means first and second housing means and providing signals commensurate therewith.

4,505,875

COOLANT STANDPIPE SYSTEM FOR PROTECTION OF A NUCLEAR REACTORS SAFETY VESSEL AGAINST BREAKDOWN FROM OVERPRESSURE

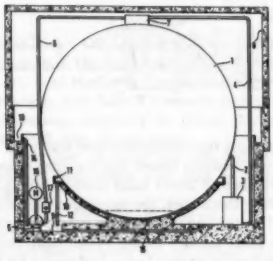
Johannes Wolters, Duren; Paul-Johannes David, Inden, and Monika Heller, Duren, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Sep. 23, 1981, Ser. No. 304,926

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 3037468

Int. Cl.³ G21C *9/00, 19/20*

U.S. Cl. 376—283 **11 Claims**



6. Apparatus for overpressure protection of the safety vessel of a nuclear reactor equipped with a supplementary safety enclosure outside the safety vessel, comprising:

an overflow collar (7) on the outside of said safety vessel (7) located for distributing liquid overflow from said collar outward over the exterior of said safety vessel;

a storage vessel (3) for storing a liquid;

a pressure equilibrium pipe connection (2) between the interior of said safety vessel (1) and said liquid-storage vessel,

a standpipe (4) having its discharge above said safety vessel (1), within said supplementary safety enclosure (8) and leading into said overflow collar (7), said standpipe (4) being so connected to said storage vessel (3) that when overpressure is produced within said safety vessel (1) pressure communicated to said storage vessel (3) through said equilibrium pipe (2) forces said liquid stored in said storage vessel (3) into and up said standpipe (4), and

a sump pump (5), on the bottom of said supplementary safety enclosure (8), equipped with a pressure-side discharge line (6) arranged to discharge above safety vessel (1), said pressure discharge line (6) of said sump pump (5) being disposed so as to discharge into said overflow collar (7).

4,505,876

NUCLEAR HEATED AND POWERED METAL EXCIMER LASER

Dennis R. Womack, Knoxville, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 11, 1982, Ser. No. 347,753

Int. Cl.³ G21C *15/02;* **H01S** *3/09*

U.S. Cl. 376—326 **5 Claims**

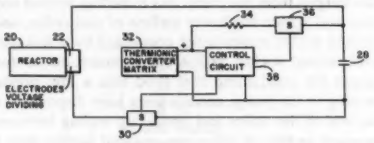
1. A nuclear heated and powered metal excimer laser comprising:

a. a nuclear reactor including a housing having a core region and a plurality of heat pipes therein, the distal end of each said heat pipes extending out of said core region;

b. thermionic converter means connected to said distal ends of each said heat pipe to provide thermionic conversion of heat to electricity;

c. metal excimer means carried in said heat pipes for vaporization by heat in said reactor core;

d. electrode means secured in the reactor core region of said heat pipes;



e. circuit means disposed between said thermionic converter means and said electrode means for storing and pulsing electricity from said thermionic converters to said electrode means, to provide an electric discharge in the vaporized metal excimer means to create a laser beam; and

f. beam focusing means carried in said reactor to focus and direct said laser beam formed in said heat pipes as a result of said electrodes being energized.

4,505,877

DEVICE FOR REGULATING THE FLOW OF A FLUID

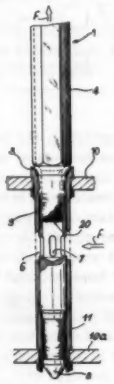
Jacky Rion, Pertuis, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 22, 1982, Ser. No. 351,215

Claims priority, application France, Feb. 26, 1981, 81 03835

Int. Cl.³ G21C *1/04*

U.S. Cl. 376—352 **4 Claims**

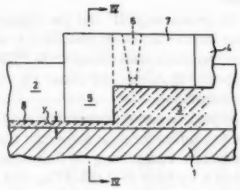


1. A device for regulating the flow of a fluid, comprising a plurality of identical gratings stacked in contiguous relationship, each grating being a plate having a plurality of regularly spaced orifices, said orifices being distributed in adjacent equilateral triangular patterns, a first said pattern in which said orifice occupies substantially all of the surface of said equilateral triangle, a second said pattern including a three-branched cross-piece, said orifices of one grating being superimposed on said cross-pieces of a contiguous grating by rotating by 60 degrees or by turning over said one grating with respect to said contiguous grating, such that the fluid follows sinuous paths through the orifices of said stacked gratings.

4,505,878
PROCESS FOR EXTRUSION OF COPPER

John B. Childs, London, and Norman R. Fairey, Carshalton, both of England, assignors to BICC Public Limited Company, London, England

Filed Jul. 21, 1982, Ser. No. 400,479
Claims priority, application United Kingdom, Aug. 6, 1981, 8124113
Int. Cl.³ B22F 3/02, 7/04; B21C 23/01
U.S. Cl. 419—67 1 Claim

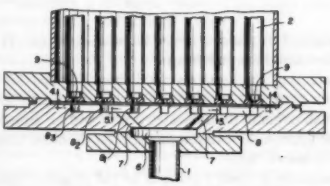


1. A continuous friction-actuated process for the extrusion of copper comprising forming a passageway extending from an entry end to an exit end between an arcuate first member and a second member in the form of a wheel having a circumferential groove formed in its peripheral surface into which groove the first member projects while rotating the wheel in such a direction that those surfaces of the passageway constituted by the groove travel from the entry end towards the exit end, feeding metal into the passageway at the entry end and extruding it from the passageway through at least one die orifice located in or adjacent to an abutment member extending across the passageway at the exit end thereof, the abutment member being of substantially smaller cross-section than the passageway so as to leave a substantial gap between the abutment member and the groove is characterised by first feeding only particulate copper into the passageway and rotating the wheel under such conditions that at least a substantial proportion of the said copper extrudes through the clearance between the abutment and the groove surface and adheres to the wheel until the copper so extruded forms a complete lining in the groove, and thereafter feeding only copper rod to the passageway while continuing to rotate the wheel, so that copper continuously extrudes through the said clearance as a lining in the groove which re-enters the passageway at the entry end while further metal extrudes through the die orifice(s).

4,505,879
REACTOR FOR NITRATION OF HYDROCARBONS IN THE GASEOUS PHASE UNDER PRESSURE

Pierre Lhonoré, Douai; Jacques Quibel, Maisons Lafitte; Bernard Jacquinot, Douai; Yvon Jestin, Rueil Malmaison, and Robert Pelletier, Paris, all of France, assignors to Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques, Paris, France

Continuation-in-part of Ser. No. 131,004, Mar. 17, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 278,004
Claims priority, application France, Mar. 28, 1979, 79 07840
Int. Cl.³ B01J 12/00, 19/24, 19/26
U.S. Cl. 422—197 4 Claims



1. In a reactor for nitration in the gaseous phase under pressure of the type including a reaction enclosure having upper and lower ends, a conduit for introducing reaction gases into said enclosure, means for introducing heat-carrying fluids, means for extracting the heat-carrying fluids, and a bank of tubes contained within the enclosure, the improvement comprising;

means for distributing the introduced reaction gases to said tubes, said distributing means being disposed between said conduit and said tubes and defining means for successively decelerating and accelerating said introduced gases, said successively decelerating and accelerating means including first channel means disposed at the base of said tubes, said first channel means comprising a plurality of concentric circular deceleration channels disposed substantially normal to said tubes, and acceleration passages connected between said deceleration channels and said tubes, and second channel means extending from said conduit through a deceleration chamber to acceleration channels radiating at an angle away from said deceleration chamber toward, and interconnecting, said first channel means, each of first channel means and said second channel means successively decelerating and accelerating said gases, whereby upon passing through said first and second channel means from said conduit, said gases become homogenously mixed prior to being distributed to said tubes.

4,505,880
PROCESS FOR THE HYDRODESULFURIZATION AND DEOXYGENATION OF A GAS CONTAINING OXYGEN AND ORGANIC SULFUR COMPOUNDS

André Deschamps, Noisy le Roi; Jean Cosyns, Maule; Jean-Francois Le Page, and Gérard Hotier, both of Rueil-Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 15, 1983, Ser. No. 466,689
Claims priority, application France, May 25, 1982, 82 09210
Int. Cl.³ B01D 53/56
U.S. Cl. 423—219 12 Claims

1. A process for hydrodesulfurizing and deoxygenating a gas (A) comprising methane, oxygen and at least one organic sulfur compound, said process comprising contacting a mixture of said gas (A) with a hydrogen-containing gas (B) first with a palladium-containing catalyst, at a temperature of 300°–450° C., and then with a second catalyst comprising molybdenum and at least one of nickel and cobalt, at a temperature of 300°–450° C.; wherein said contacting is effected at a space velocity of 1,000–25,000 with respect to each said catalyst.

4,505,881
AMMONIUM POLYSULFIDE REMOVAL OF HCN FROM GASEOUS STREAMS, WITH SUBSEQUENT PRODUCTION OF NH_3, H_2S, AND CO_2

Zaida Diaz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 29, 1983, Ser. No. 556,256
Int. Cl.³ C01C 3/00; C01B 17/16, 17/02
U.S. Cl. 423—236 24 Claims

1. A process for removing HCN from a gaseous stream containing HCN comprising

(a) contacting said gaseous stream in a contact zone with a solution containing ammonium polysulfide under conditions to convert HCN, and producing a solution containing ammonium polysulfide and ammonium thiocyanate, and a gas stream having reduced HCN content;

(b) removing solution containing ammonium polysulfide and ammonium thiocyanate from the contact zone, and stripping H_2S and NH_3 from said solution in a stripping zone, producing a remaining solution containing sulfur and having reduced ammonium polysulfide content; and

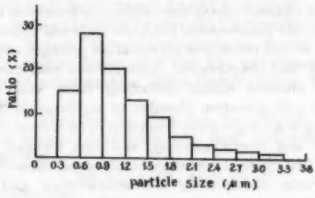
(c) hydrolyzing ammonium thiocyanate in said remaining solution and producing NH_3, H_2S, and CO_2.

4,505,882

PROCESS FOR MANUFACTURING URANIUM DIOXIDE POWDER

Shin-ich Hasegawa; Eiji Takano, and Masao Sekine, all of Ibaraki, Japan, assignors to Mitsubishi Nuclear Fuel Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1983, Ser. No. 478,372
Claims priority, application Japan, Sep. 14, 1982, 57-160426
Int. Cl.³ C01G *43/025*
U.S. Cl. 423—261 4 Claims



1. In the process for manufacturing uranium dioxide powder which comprises hydrolyzing uranium hexafluoride into uranyl fluoride, adding to said uranyl fluoride with ammonium hydroxide to precipitate ammonium diuranate, and calcining and reducing said precipitated ammonium diuranate into uranium dioxide, improvements comprising forming fine uranium dioxide having a high sinterability and coarse uranium dioxide having a low sinterability continuously and alternately in the course of one process and mixing two kinds of said uranium dioxides by changing at least one of the precipitation conditions of said ammonium diuranate with a time period corresponding to 1/12–½ of a time required for forming a lot under the same condition of calcining and reducing of said ammonium diuranate.

4,505,883

METHOD FOR MANUFACTURING BORON-FREE SILICON DIOXIDE

Lutz Vité, and Hannelore Mews, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 25, 1983, Ser. No. 555,267
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1982, 3246121
Int. Cl.³ C01B *33/12*
U.S. Cl. 423—335 21 Claims

1. Method for manufacturing boron-free silicon dioxide which is suitable as a base material for manufacturing silicon for semiconductor elements, particularly for solar cells, by purification of hexafluorosilicic acid, said method comprising the steps of:

(a) preparing an aqueous solution of boron-containing hexafluorosilicic acid, which acid can be transferred to an organic phase by treatment with an organic compound immiscible with water; and

(b) converting said organic phase to boron-free hexafluorosilicic acid by subsequent fluid-fluid-extraction in an acid medium, which then is decomposed into SiO_2.

4,505,884

PROCESS FOR PRODUCING HF FROM IMPURE PHOSPHORIC ACIDS

Elie M. Chemtob, Claremont, and Gary L. Beer, Huntington Beach, both of Calif., assignors to Occidental Research Corporation, Los Angeles, Calif.

Filed May 17, 1982, Ser. No. 378,456
The portion of the term of this patent subsequent to Apr. 12, 2000, has been disclaimed.
Int. Cl.³ C01B *7/19, 25/16*
U.S. Cl. 423—484 6 Claims

1. A process for producing HF and for removing aluminum and fluorine from impure aqueous phosohoric acid analyzing, in weight percent, no more than about 45% P_2O_5, in the range of about 2% to about 4% Al_2O_3 and about 1% to about 2% F., said processing comprising:

(a) aging said impure aqueous phosphoric acid at an elevated temperature for sufficient time to permit the formation of solid precipitation comprising a fluoroaluminum phosphate which is a hydrate of $AlFHPO_4$, said elevated temperature being between 25° C. and the boiling temperature of said impure aqueous phosphoric acid;

(b) separating said solid precipitate from the aged phosphoric acid, thereby removing aluminun and fluorine from the impure, aqueous phosphoric acid;

(c) thermally decomposing said separated solid precipitate without treating with other reactants to evolve HF; and

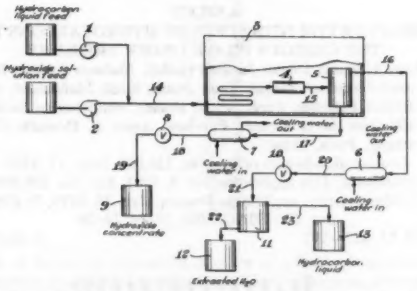
(d) recovering said evolved HF.

4,505,885

METHOD OF REMOVING WATER FROM ALKALI METAL HYDROXIDE SOLUTIONS

William C. Sumner, Jr.; Gale G. Hoyer, both of Midland, Mich., and William G. Kozak, Decatur, Ill., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 20, 1983, Ser. No. 505,639
Int. Cl.³ C01D *1/00*
U.S. Cl. 423—592 26 Claims



1. A method to remove water from an aqueous alkali metal hydroxide solution comprising:

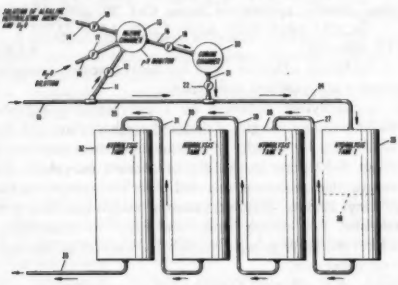
(a) contacting the aqueous alkali metal hydroxide solution with a sufficient amount of an organic liquid to form at least an organic liquid-water phase and an aqueous alkali metal hydroxide solution phase at an elevated temperature and pressure, and

(b) separating at least a portion of the organic liquid-water phase from the aqueous alkali metal hydroxide solution phase.

4,505,886
PROCESS FOR PREPARING HIGH QUALITY TITANIUM DIOXIDE

Charles A. Cody, East Windsor; William W. Reichert, Plainsboro; Steven J. Kemnetz, Trenton, and Edward D. Magauran, Mt. Holly, all of N.J., assignors to NL Industries, Inc., New York, N.Y.

Filed Jul. 1, 1983, Ser. No. 510,249
Int. Cl.[3] C01G *23/053*
U.S. Cl. 423—616 18 Claims



1. A process for preparing high quality titanium dioxide comprising:

(a) forming a first acidified solution of titanium sulfate;

(b) forming a defined volume of a first seed solution precursor which comprises an acidified solution of titanium sulfate;

(c) selecting seed curing conditions of

(i) a curing temperature in the range of from about 0° to about 100° C.,

(ii) a curing time in the range of from about 2 seconds to about 150 hours, and

(iii) an amount of alkaline neutralizing agent sufficient to neutralize from about 0 to about 60 mole % of the acid in the defined volume of the seed solution precursor whereby a curing pH in the range of from about 0.2 to about 7.0 is obtained;

(d) curing the seed solution precursor under the selected conditions to form a seed solution;

(e) mixing the seed solution with the acidified solution of titanium sulfate;

(f) establishing a mixture temperature sufficient to cause the formation of titanium dioxide hydrate;

(g) recovering the titanium dioxide hydrate;

(h) calcining the titanium dioxide hydrate to form titanium dioxide;

(i) incorporating the titanium dioxide in a defined amount into first and second coating compositions;

(j) measuring the reflectance of the first coating composition and the tint strength of the second coating composition;

(k) forming another acidified solution of titanium sulfate which is substantially identical to said first acidified solution of titanium sulfate;

(l) forming another seed solution precursor which is substantially identical to said first seed solution precursor;

(m) maintaining two of the seed curing conditions constant while selecting a different value of the third seed curing condition within the defined range;

(n) repeating steps (d) through (j) with said another seed solution precursor and said another acidified solution of titanium sulfate;

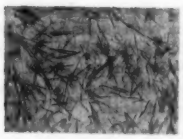
(o) repeating steps (k) through (n) a sufficient number of times with the same two seed curing conditions being maintained constant and the value of the third seed curing condition being different in each repetition to determine a maximum reflectance and tint strength; and

(p) preparing high quality titanium dioxide using a seed solution which is formed from a seed solution precursor substantially identical in composition to the first seed solution precursor, is cured under the determined curing conditions giving the maximum values of reflectance and tint strength and is mixed with an acidified solution of titanium sulfate substantially identical in composition as the first acidified solution of titanium sulfate in substantially the identical volume ratio.

4,505,887
FIBROUS MAGNESIUM OXIDE AND PROCESS FOR PRODUCTION THEREOF

Shigeo Miyata; Akira Okada, both of Takamatsu, and Toru Hirose, Kagawa, all of Japan, assignors to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1984, Ser. No. 625,296
Claims priority, application Japan, Jun. 27, 1983, 58-114365
Int. Cl.[3] C01F *5/14*
U.S. Cl. 423—635 4 Claims



(x 150)

1. A magnesium oxide having a cubic system needle-like crystal structure and a length-to-diameter ratio, determined by an electron microscope at a magnification of 10,000, of at least about 5.

3. A process for producing a magnesium oxide having a cubic system needle-like crystal structure and a length-to-diameter ratio, determined by an electron microscope at a magnification of 10,000, of at least about 5, which comprises calcining a basic magnesium compound having a needle-like crystal structure expressed by the following formula

$$Mg(OH)_{2-nx}A_x^{n-}.mH_2O$$

wherein A^{n-} represents a monovalent (n=1) to tetravalent (n=4) anion, x is $0.2 \leqq x \leqq 0.5$, and m is $0 < m \leqq 2$, or a magnesium hydroxide having a needle-like crystal structure, at a temperature of not less than about 400° C. to convert it to the magnesium oxide.

4,505,888
TRACER FOR CIRCULATION DETERMINATIONS

Herbert Moore, Wayland, Mass.; Stephen Santos, Manchester, N.H., and Robert D. Wysong, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed May 27, 1983, Ser. No. 498,867
Int. Cl.[3] A61K *43/00, 49/00*
U.S. Cl. 424—1.1 46 Claims

42. A method for determining the characteristics of a circulatory system, said method comprising introducing into said system particles comprising a radioactive labelled ion exchange core having a polymeric coating to form a coated core; said coated core having been treated with a compound having an oxirane group, thereby increasing the mass of said coated core; and determining the flow of particles in the system at a position removed from the site of introduction of said particles into said system.

4,505,889

PROTRACTED RELEASE MICROBIOCIDAL ARTICLE FOR AQUEOUS SYSTEMS

David R. Amick, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 23, 1982, Ser. No. 422,055
Int. Cl.[3] A01N *25/34*
U.S. Cl. 424—21 10 Claims

1. An article useful for storing, handling, transporting, and providing a microbiocidal compound at a controlled rate in a method for controlling living microorganisms in an aqueous system comprising

(a) a flexible, water-permeable membrane having a film thickness sufficient to maintain the integrity thereof when sealed and sufficient water vapor permeability to permit diffusion of water therethrough and containing sealed therein

(b) a particulate solid microbiocidal composition useful in aqueous systems comprising:

(i) about 0.1–70 weight %, based on total weight of said composition, of at least one water-soluble microbiocidal compound having a relatively low water solubility of less than about 1000 ppm or a combination thereof with one or more other microbiocidal compounds to give a combination characterized by a relatively low water solubility of less than about 1000 ppm; and

(ii) about 99.9–30 weight %, based on total weight of said composition, of an inert, finely-divided water-insoluble solid carrier material.

4,505,890

CONTROLLED RELEASE FORMULATION AND METHOD

Nemichand B. Jain, Monmouth Junction, and Mahendra R. Patel, East Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 30, 1983, Ser. No. 509,493
Int. Cl.[3] A61K *9/24, 9/22, 9/62*
U.S. Cl. 424—21 9 Claims

1. A controlled release formulation in the form of a tablet from which the angiotensin converting enzyme inhibitor (S)-1-[3-(benzoylthio)-2-methyl-1-oxopropyl]-L-proline is released at a controlled rate, comprising a core and a pharmaceutically acceptable coating therefor, said coating comprising one or more film-formers or binders and one or more plasticizers, and said core comprising from about 15 to about 85% by weight (S)-1-[3-(benzoylthio)-2-methyl-1-oxopropyl]-L-proline, from about 8 to about 14% by weight of one or more hydrocolloid gelling agents having a viscosity of within the range of from about 8000 to about 100,000 centipoises in 2% solution of 20° C., and which is methyl celulose, hydroxypropyl cellulose, hydroxy ethyl cellulose, sodium carboxymethyl cellulose or mixtures thereof, from about 8 to about 15% by weight of one or more excipients, from about 0.5 to about 8% by weight of one or more lubricants, from 0 to about 8% by weight of one or more anti-adherents, and from 0 to about 3% by weight water, all of said % being based on the weight of said core, said tablet adapted to undergo substantially zero order release of (S)-1-[3-(benzoylthio)-2-methyl-1-oxopropyl]-L-proline over an 8 hour or more period.

4,505,891

MEDICINAL ADHESIVE SHEETS FOR HEART DISEASES AND A PROCESS FOR THE PREPARATION THEREOF

Toshio Ito, Tokyo, Japan, assignor to Nichiban Co., Ltd.; Nippon Kayaku Kabushiki Kaisha and Taiho Pharmaceutical Company, Limited, all of Tokyo, Japan

PCT No. PCT/JP81/00291, § 371 Date Jun. 9, 1982, § 102(e) Date Jun. 9, 1982, PCT Pub. No. WO82/01317, PCT Pub. Date Apr. 29, 1982
PCT Filed Oct. 19, 1981, Ser. No. 387,885
Claims priority, application Japan, Oct. 20, 1980, 55-146465
Int. Cl.[3] A61K *9/70;* A61L *15/03;* A61F *13/00*
U.S. Cl. 424—28 6 Claims

1. A medicinal adhesive sheet for heart diseases comprising an adhesive composition comprising:

(A) a copolymer obtained by copolymerizing (a) about 60–98 parts by weight of dodecyl methacrylate, (b) about 40–2 parts by weight of a functional monomer and (c) about 0–40 parts by weight of at least one short chain unsaturated monomer selected from the group consisting of vinyl acetate, alkyl acrylates in which the alkyl group contains 1–8 carbon atoms and alkyl methacrylates in which the alkyl group contains 1–8 carbon atoms, and

(B) nitroglycerin;

wherein said adhesive composition is supported on a base and is covered with a separator.

4,505,892

INFECTIOUS BRONCHITIS VACCINE FOR POULTRY

Peter Apontoweil, Leersum, and Manfred M. Krasselt, De Bilt, both of Netherlands, assignors to Gist-Brocades N.V., Netherlands

Division of Ser. No. 437,517, Oct. 29, 1982, , which is a division of Ser. No. 209,583, Nov. 24, 1980, Pat. No. 4,357,320. This application Aug. 31, 1983, Ser. No. 528,230
Claims priority, application Netherlands, Nov. 30, 1979, 7908687; Sep. 9, 1980, 8005083
Int. Cl.[3] A61K *39/12;* C12N *7/00, 7/08, 7/02*
U.S. Cl. 424—89 14 Claims

1. A live or inactivated infectious bronchitis vaccine for poultry which comprises virus material derived from at least one virus strain selected from the group consisting of culture Nos. CNCTC A 07/80, CNCTC A 08/80, CNCTC A 09/80, CNCTC A 010/80, CNCTC A 011/80, CNCTC A 013/80, CNCTC A 014/80, CNCTC A 015/80 and CNCTC A 016/80 deposited at the Czechoslovak National Collection of Type Cultures with the Institute of Hygiene and Epidemiology in Prague, Czechoslovakia and a suitable carrier therefor.

7. A process for the preparation of an infectious bronchitis vaccine which comprises the steps of propagating at least one infectious bronchitis virus selected from the group consisting of culture Nos. CNCTC A 07/80, CNCTC A 08/80, CNCTC A 09/80; CNCTC A 010/80, CNCTC A 011/80, CNCTC A 013/80, CNCTC A 014/80, CNCTC A 015/80 and CNCTC A 016/80 deposited with the Czechoslovak National Collection of Type Cultures with the Institute of Hygiene and Epidemiology in Prague, Czechoslovakia as seed virus in a suitable cell culture collecting and purifying the cultivated virus material and lyophilizing said virus material.

4,505,893

PURIFIED PLASMINOGEN ACTIVATOR, PROCESS FOR ITS PRODUCTION AND THROMBOLYTIC COMPOSITION CONTAINING IT

Toshihito Mori, Tokyo; Hideo Yoshizaki, Saitama, and Akio Hasegawa, Shizuoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka and Kowa Co., Ltd., Aichi, both of, Japan

Filed Aug. 1, 1983, Ser. No. 519,347

Claims priority, application Japan, Aug. 2, 1982, 57/133633

Int. Cl.[3] A61K *37/48*; C12P *21/00*; C12N *5/02*

U.S. Cl. 424—94 10 Claims

1. A purified plasminogen activator obtained from a tissue cultured liquor of human normal tissue derived cells and having the following properties:

(a) molecular weight measured by gel filtration: 63,000±10,000,

(b) isoelectric point: 7.0–8.5,

(c) affinity to fibrin: present,

(d) affinity to concanavalin A: present,

(e) optimum pH: 7–9.5, and

(f) stability: does not lose activity at 60° C. for 10 hours but loses about 5% of activity at pH 2–3 at 98° C. for a minute.

2. A process for the production of a plasminogen activator having the following properties:

(a) molecular weight measured by gel filtration: 63,000±10,000,

(b) isoelectric point: 7.0–8.5,

(c) affinity to fibrin: present,

(d) affinity to concanavalin A: present,

(e) optimum pH: 7–9.5, and

(f) stability: does not lose activity at 60° C. for 10 hours but loses about 5% of activity at pH 2–3 at 98° C. for a minute, which comprises separating a fraction containing the plasminogen activator from a tissue cultured liquor of human normal tissue derived cells and purifying it.

4,505,894

THERAPEUTIC COMPOUNDS CONTAINING β-LACTAMS

Roger J. Ponsford, Horsham, England, assignor to Beecham Group Limited, England

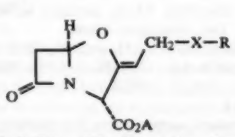
Continuation of Ser. No. 208,150, Nov. 19, 1980, abandoned, which is a continuation of Ser. No. 930,574, Aug. 3, 1978, abandoned, which is a division of Ser. No. 796,712, Jan. 24, 1977, Pat. No. 4,428,958. This application Aug. 30, 1982, Ser. No. 412,591

Claims priority, application United Kingdom, Jan. 31, 1976, 03892/76; May 8, 1976, 19002/76

Int. Cl.[3] A61K *35/00*

U.S. Cl. 424—114 98 Claims

50. A method of treating bacterial infections in humans and animals which comprises administering to a human or animal in need thereof a synergistically effective amount of a compound of the formula (II):



(II)

wherein X is S, SO or SO_2, R is an inert hydrocarbon of up to 20 carbon atoms unsubstituted or substituted by halogen, by a member selected from the group consisting of OR^1, $O.COR^1$, $CO.R^1$, CO_2R^1, NHR^1, NR^1R^2, $NH.CO.R^1$, NR^2CO^1, $NHCO_2R^1$ and $NR^2CO_2R^1$ wherein R^1 is hydrogen or a hydrocarbon of up to 8 carbon atoms and R^2 is alkyl of 1 to 3 carbon atoms, or by halogen and a member of said group which will not lead to rapid degradation of the compound of the formula (II), or R is a heteroaromatic ring of 5 or 6 ring members unsubstituted or substituted by alkyl of up to 3 carbon atoms or by alkyl of up to 3 carbon atoms substituted by $CONH_2$ or CO_2H and A is a group such that CO_2A represents a carboxylic acid group or a non-toxic salt or non-toxic ester thereof, and an antibacterially effective amount of a penicillin, in combination with a pharmaceutically acceptable carrier.

4,505,895

ANTIBIOTIC 273_{a1}

Alexander D. Argoudelis, Portage; Vincent P. Marshall, Kalamazoo, and Paul F. Wiley, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 30, 1983, Ser. No. 480,604

Int. Cl.[3] A61K *35/74*; C12P *1/06*

U.S. Cl. 424—117 3 Claims

2. Essentially pure antibiotic $273a_1\alpha$, which is characterized by the following characteristic spectra and other data:

(a) an infrared absorption spectrum as shown in FIG. 8 of the drawings;

(b) an ultraviolet absorption spectrum as shown in FIG. 9 of the drawings;

(c) a proton magnetic resonance spectrum as shown in FIG. 10 of the drawings;

(d) a C-13 nuclear magnetic resonance spectrum as shown in FIG. 11 of the drawings;

(e) a mass spectrum as shown in FIG. 12 of the drawings;

(f) an HPLC chromatogram as shown in FIG. 13 of the drawings;

(g) a melting point of ca. 120° C. with decomposition;

(h) an optical rotation $[\alpha]_D^{25} - 31°$ (C, 0.905 methanol);

(i) elemental analysis: Calcd for $C_{44}H_{64}N_4O_{23}S_3$: C, 47.48; H, 5.75; N, 5.03; S, 8.63; found: C, 46.82; H, 5.78; N, 4.93; S, 8.72;

(j) molecular weight of 1112; and, salts thereof with inorganic and organic bases.

4,505,896

METHOD OF TREATING ACNE VULGARIS AND COMPOSITION

Joel E. Bernstein, Deerfield, Ill., assignor to Elorac, Ltd., Northbrook, Ill.

Continuation-in-part of Ser. No. 31,535, Apr. 19, 1979, abandoned. This application Nov. 24, 1980, Ser. No. 209,649

Int. Cl.[3] A61K *31/455*

U.S. Cl. 424—164 25 Claims

1. A method of decreasing the inflammatory lesions of acne vulgaris in human patients having such inflammatory lesions, said method comprising administering a therapeutically effective amount of nicotinamide to a patient having such inflammatory lesions.

4,505,897

CYCLIC PENTAPEPTIDES DISPLAYING SOMATOSTATIN ANTAGONISM AND METHOD OF TREATMENT OF MAMMALS THEREWITH

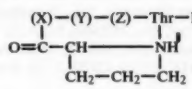
David H. Coy, New Orleans, and William A. Murphy, Slidell, both of La., assignors to The Administrators of the Tulane Educational Fund, New Orleans, La.

Continuation-in-part of Ser. No. 484,770, Apr. 18, 1983, abandoned. This application Jun. 6, 1983, Ser. No. 501,321

Int. Cl.[3] C07C *103/52*; A61K *37/02*

U.S. Cl. 514—11 10 Claims

1. A cyclic pentapeptide compound having the structural formula:



wherein

X is phenylalanyl;

Y is D-tryptophyl;
Z is lysyl; Thr is threonyl; and
R_1 is hydrogen or benzyl; or a pharmaceutically acceptable salt thereof.

4,505,898

DERIVATIVES OF ACETYLSALICYLIC ACID AND SUBSTITUTED PHENYLACETIC ACIDS AND COMPOSITIONS CONTAINING THEM

Robert E. Marks, 2 Burwood Close, Merrow, Guildford, Surrey; James S. Burton, The Barn Cottage, Bunch La.; John A. Elvidge, Kylemore, Derby Rd., both of Haslemere, Surrey, and Saresh Shah, 2 Chestnut Grove, Tottenham, London N17, all of England

Division of Ser. No. 370,657, Apr. 21, 1982, Pat. No. 4,452,783. This application Oct. 27, 1983, Ser. No. 548,528

Int. Cl.³ C07C *103/52;* **A61K** *37/02*

U.S. Cl. 514—18 **9 Claims**

4. Peptide derivatives of the formula:

$$A—NH—R_1—CO)_x(NH—R_2—CO)_yNH—R_3—COOH$$

in which A is acetylsalicyloyl, 4-allyloxy-3-chlorophenylacetyl, or 4-n-propoxy-3-chloro-phenylacetyl;
R_1, R_2, and R_3 are the same or different and are each selected from the group consisting of residues of glycine, alanine, valine, leucine, isoleucine, serine, homoserine, threonine, proline, hydroxyproline, cysteine, homocysteine, methionine, phenylalanine, tyrosine, dopa, tryptophan, ornithine, lysine, hydroxylysine, histidine, aspartic acid, asparagine, glutamic acid, and glutamine;
x is 0 or 1;
y is 1 when A is acetylsalicyloyl, and 0 or 1 when A is 4-allyloxy-3-chloro-phenylacetyl or 4-n-propoxy-3-chlorophenylacetyl;
provided that x and y are not simultaneously zero;
or a physiologically acceptable salt or lower alkyl ester thereof.

4,505,899

REFINED DETOXIFIED ENDOTOXIN PRODUCT

Edgar E. Ribi, and John L. Cantrell, both of Hamilton, Mont., assignors to Ribi ImmunoChem Research, Inc., Hamilton, Mont.

Continuation of Ser. No. 382,406, May 26, 1982, Pat. No. 4,435,386. This application Mar. 6, 1984, Ser. No. 586,663

Int. Cl.³ A61K *37/00;* **C07G** *7/00*

U.S. Cl. 514—8 **12 Claims**

1. A therapeutic composition for imparting immunotherapy comprising an effective amount of each of:
(a) refined detoxified endotoxin having no detectable 2-keto-3-detoxyoctanoate, between 350 and 475 nmoles/mg of phosphorus and between 1700 and 2000 nmoles/mg of fatty acids;
(b) an acetone precipitated by-product of endotoxic glycolipids extracted with a mixture of chloroform and methanol;
(c) trehalose dimycolate; and a pharmaceutically acceptable carrier.

4,505,900

REFINED DETOXIFIED ENDOTOXIN PRODUCT

Edgar E. Ribi, Hamilton; Steven M. Schwartzman, Stevensville, and John L. Cantrell, Hamilton, all of Mont., assignors to Ribi ImmunoChem Research, Inc., Hamilton, Mont.

Continuation of Ser. No. 382,405, May 26, 1982, Pat. No. 4,436,728. This application Mar. 8, 1984, Ser. No. 587,567

Int. Cl.³ A61K *37/00;* **C07G** *7/00;* **A01N** *65/00*

U.S. Cl. 514—2 **12 Claims**

1. A therapeutic composition for imparting immunotherapy comprising an effective amount of each of:
(a) refined detoxified endotoxin having no detectable 2-keto-3-deoxyoctanoate, between 350 and 475 nmoles/mg of phosphorus and between 1700 and 2000 nmoles/mg of fatty acids;
(b) cell wall skeleton;
(c) trehalose dimycolate; and a pharmaceutically acceptable carrier.

4,505,901

COMPOSITIONS AND METHODS FOR TOPICAL TREATMENT OF CUTANEOUS LEISHMANIASIS WITH PAROMOMYCIN

Joseph El-On, and Geoffrey P. Jacobs, both of Jerusalem, Israel, assignors to Orvet B.V., Holland, N.Y.

Filed Mar. 22, 1983, Ser. No. 477,741

Claims priority, application United Kingdom, Mar. 29, 1982, 8209231

Int. Cl.³ A61K *31/71;* **C07H** *15/22*

U.S. Cl. 514—38 **18 Claims**

9. Method for the topical treatment of cutaneous leishmaniasis, which comprises applying to lesions of a patient suffering from the same a composition comprising a quaternary ammonium salt selected from the group consisting of methylbenzethonium chloride, benzethonium chloride, benzalkonium chloride, cetalkonium chloride and cetrimonium bromide and paromomycin or a non-toxic acid addition salt thereof in an amount which with said quaternary ammonium salt constitutes a cutaneous leishmaniasis treatment effective amount.

4,505,902

SKIN TREATMENT PREPARATION

Mary A. Millard, 2068 Belover Dr., Memphis, Tenn. 38127

Continuation-in-part of Ser. No. 418,592, Sep. 15, 1982, abandoned. This application Feb. 21, 1984, Ser. No. 582,078

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195.1 **3 Claims**

1. A skin treatment preparation having the following formulation:

INGREDIENT	PERCENTAGE BY WEIGHT
Refined Mineral Oil	54.25%
Apricot Kernel Oil	26.00%
Aloe Vera Juice	18.00%
Wheat Germ Oil	1.00%
Avocado Oil	0.50%
Cod Liver Oil	0.10%
Propylparaben	0.10%
Butylated Hydroxyanisole	0.05%

4,505,903

PYRIDINE SOLUBLE EXTRACT OF A MICROORGANISM

John L. Cantrell, Hamilton, Mont., assignor to Ribi ImmunoChem Research, Inc., Hamilton, Mont.

Continuation of Ser. No. 393,822, Jun. 30, 1982, abandoned. This application Apr. 17, 1984, Ser. No. 600,606

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195.1 **7 Claims**

1. A pharmaceutical composition for treating tumors selected from the group of bovine squamous cell carcinoma, bovine fibrosarcoma, equine sarcoid, equine melanoma, equine squamous cell carcinoma, canine mammary tumors, canine adenoma and canine melanoma, comprising an anti-tumor effective amount of a combination of an effective amount of a purified pyridine-soluble extract obtained from a microorganism selected from the group consisting of *M. bovis* BCG, *M. phlei, M. smegmatis, M. kansasii, Nocardia rubra, Corynebacterium diphtheriae* and *Corynebacterium parvum,* said extract obtained by:
(a) preparing a whole cell paste of said microorganism;

(b) washing said paste;
(c) treating said paste with pyridine to produce an extract and a residue;
(d) removing said pyridine from said extract; and
(e) dialyzing said dried extract to obtain said purified pyridine-soluble extract, an effective amount of cell wall skeleton; and an effective amount of trehalose dimycolate; and a pharmaceutically acceptable carrier.

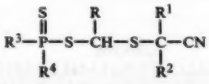
4,505,904

S-(1-(1-CYANOALKYLTHIO)ALKYL)PHOSPHORODITHIOIC COMPOUNDS AS PESTICIDES

James R. Sanborn, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 5, 1983, Ser. No. 520,882
Int. Cl.[3] **A01N** *57/12;* **C07F** *9/141*
U.S. Cl. 514—112 **11 Claims**

1. A compound of the formula I



I

wherein r is a methyl group or an ethyl group; R^1 and R^2 each independently is a methyl group or an ethyl group; or R^1 and R^2 together with the carbon atom to which they are attached form a cyclopropyl group; and R^3 and R^4 each independently is an alkoxy group containing from 1 to 4 carbon atoms.

2. A method for combating pests at a locus, which comprises applying to the locus or the pests, a pesticidally-effective amount of a compound according to claim 1.

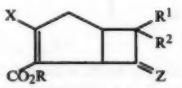
4,505,905

CYCLOBUTANONE ANTIBACTERIALS

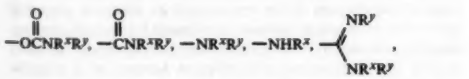
George A. Boswell, Jr., and Anthony J. Cocuzza, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 15, 1982, Ser. No. 368,877
Int. Cl.[3] **C07C** *149/40;* **A61K** *31/215*
U.S. Cl. 514—150 **30 Claims**

1. A compound of the formula



wherein:
R is $CHPh_2$ or 1-naphthylmethyl;
R^1 is H;
R^2 is H or $C(OH)R^4R^5$;
X is $S(O)_nR^3$;
n is 1 or 2;
R^3 is selected from the group consisting of alkyl having 1 to 10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, having 3 to 6 carbon atoms in the cycloalkyl ring and 1 to 6 carbon atoms in the alkyl moieties; phenyl and aralkyl, wherein the aryl moiety is phenyl and the aliphatic portion has 1 to 6 carbon atoms; heterocyclyl and heterocyclylalkyl; all of said R^3 substituents being unsubstituted or substituted by a member selected from the group consisting of chloro, bromo, fluoro, R^x, OR^x,



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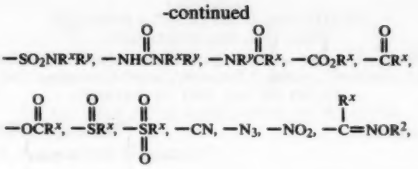
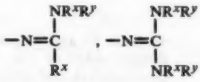
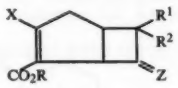




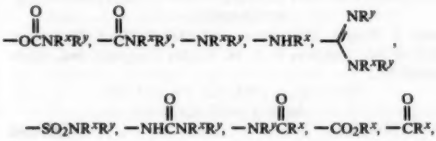
wherein R^x and R^y are independently selected from hydrogen; alkyl of 1 to 10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, of 3 to 6 carbon atoms in the cycloalkyl ring and 1 to 6 carbon atoms in the alkyl moieties; phenyl and aralkyl, wherein the aryl moiety is phenyl and the aliphatic portion has 1 to 6 carbon atoms; heterocyclyl and heterocyclylalkyl; and wherein the hetero atom or atoms in the heterocyclic moieties are selected from the group consisting of 1 to 4 oxygen, nitrogen or sulphur atoms and wherein the alkyl moieties associated with said heterocyclic moieties have 1 to 6 carbon atoms;
R^4 is selected from hydrogen, alkyl, cycloalkyl, phenyl, and aralkyl;
R^5 is selected from hydrogen, alkyl, cycloalkyl, phenyl, and aralkyl;
R^4 and R^5, together, can form a ring of 4 to 8 carbon atoms;
Z is 0.

22. An antibacterial pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

28. A compound of the formula



wherein:
R is H, CH_3, CH_2Ph, $CHPh_2$, CH_2PhNO_2, 1-naphthylmethyl, CH_2OCOt-Bu, or a physiologically acceptable metal or amine salt cation;
R^1 is H;
R^2 is H, Cl, or $C(OH)R^4R^5$;
X is $S(O)_nR^3$, Cl, Br, H;
n is 0, 1, or 2;
R^3 is selected from the group consisting of alkyl having 1 to 10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, having 3 to 6 carbon atoms in the cycloalkyl ring and 1 to 6 carbon atoms in the alkyl moieties; phenyl and aralkyl, wherein the aryl moiety is phenyl and the aliphatic portion has 1 to 6 carbon atoms; heterocyclyl and heterocyclylalkyl; all of said R^3 substituents being unsubstituted or substituted by a member selected from the group consisting of chloro, bromo, fluoro, R^x, OR^x,



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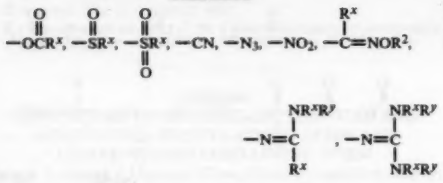


wherein R^x and R^y are independently selected from hydrogen; alkyl of 1 to 10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, of 3 to 6 carbon atoms in the cycloalkyl ring and 1 to 6 carbon atoms in the alkyl moieties; phenyl and aralkyl, wherein the aryl moiety is phenyl and the aliphatic portion has 1 to 6 carbon atoms; heterocyclyl and heterocyclylalkyl; and wherein the hetero atom or atoms in the heterocyclic moieties are selected from the group consisting of 1 to 4 oxygen, nitrogen or sulphur atoms and wherein the alkyl moieties associated with said heterocyclic moieties have 1 to 6 carbon atoms;

R^4 is selected from hydrogen, alkyl, cycloalkyl, phenyl and aralkyl;

R^5 is selected from hydrogen, alkyl, cycloalkyl, phenyl, and aralkyl;

R^4 and R^5, together, can form a ring of 4 to 8 carbon atoms;

Z is $(OR^6)_2$ or $—OCH_2CH_2O—$;

R^6 is lower alkyl of 1 to 6 carbon atoms.

4,505,906

HYDROXYVITAMIN D_2 ISOMERS

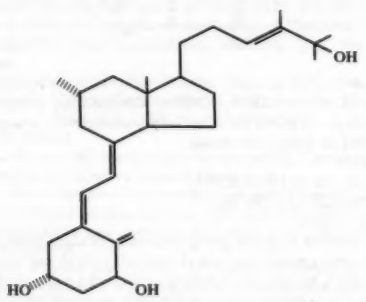
Hector F. DeLuca; Heinrich K. Schnoes; Rafal R. Sicinski, and Yoko Tanaka, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jan. 30, 1984, Ser. No. 575,115

Int. Cl.³ C07J 9/00

U.S. Cl. 514—167 **4 Claims**

1. A compound having the formula



3. A pharmaceutical composition comprising the compound of claim 1 and a pharmaceutically acceptable excipient.

4,505,907

N-FORMYL AND N-HYDROXYMETHYL-3-PHENOXY-1-AZETIDINECARBOXAMIDES

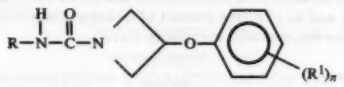
George J. Wright, Midlothian, and Lina C. Teng, Richmond, both of Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed Sep. 2, 1982, Ser. No. 414,101

Int. Cl.³ A61K 31/395; C07D 205/04

U.S. Cl. 514—210 **3 Claims**

1. A process which comprises orally administering to a mammal for its anticonvulsant effect an effective amount of a compound selected from the group consisting of N-formyl and N-hydroxymethyl-3-phenoxy-1-azetidinecarboxamides having the formula:



wherein;

R is selected from formyl or hydroxymethyl,

R^1 is selected from the group consisting of hydrogen, fluoro, loweralkyl, loweralkoxy, trifluoromethyl, acetyl, N-formylcarboxamido or N-hydroxymethylcarboxamido; and

n is selected from 1 to 3 inclusive wherein R^1 may be the same or different.

4,505,908

7-BROMO-5-(2-HALOPHENYL)-1H-2,3-DIHYDRO-1,4-BENZODIAZEPINE PHARMACEUTICALS

Horst Zeugner; Michael Ruhland; Hans Liepmann, all of Hanover; Wolfgang Milkowski, Burgdorf, and Herbert Muesch, Wennigsen, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hannover, Fed. Rep. of Germany

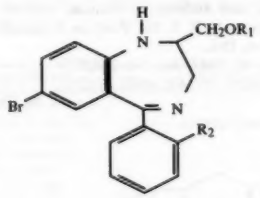
Filed Sep. 23, 1982, Ser. No. 422,297

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138769

Int. Cl.³ A61K 31/55; C07D 243/16, 487/04

U.S. Cl. 514—221 **7 Claims**

1. A 7-bromo-5-(2-halophenyl)-1H-2,3-dihydro-1,4-benzodiazepine compound of the formula I:



I

in which R_1 is a hydrogen atom, a methyl or ethyl radical, or an acetyl radical, and R_2 is a chlorine atom, and acid addition salts thereof.

7. A pharmaceutical composition, comprising a compound as claimed in claim 1 and a solid or liquid pharmaceutical diluent or carrier.

4,505,909

METHOD AND COMPOSITION FOR TREATING AND PREVENTING IRRITATION OF THE EYES

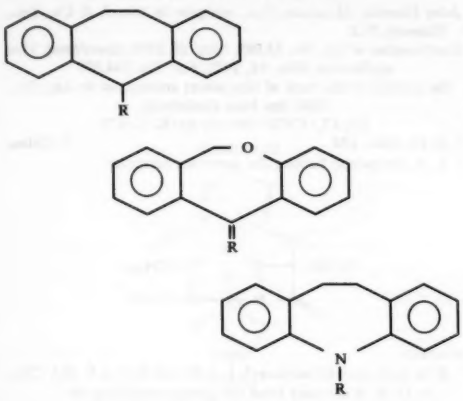
Joel E. Bernstein, 615 Brierhill Rd., Deerfield, Ill. 60015

Division of Ser. No. 188,249, Sep. 17, 1980, Pat. No. 4,370,324. This application Sep. 27, 1982, Ser. No. 425,126

Int. Cl.³ A61K 31/33, 31/335, 31/135

U.S. Cl. 514—217 **17 Claims**

1. A method of preventing and treating irritation of the mucous membranes of the eye caused by allergies, chemical pollutants, or physical irritants, manifested by redness, tearing, burning, discomfort or itching, comprising applying topically to said eye a therapeutically effecive amount of a tricyclic anti-depressant selected from the group consisting of:



wherein R is an aliphatic secondary or tertiary amine having a three-aliphatic carbon chain connected to a nitrogen atom, with the seondary amine having the nitrogen atom attached to said chain and to one carbon atom, and with the tertiary amine having the nitrogen atom attached to said chain and to two carbon atoms; and

a therapeutically effective amount of an ophthalmically acceptable vasoconstrictor.

4,505,910

AMINO-PYRIMIDINE DERIVATIVES, COMPOSITIONS AND USE

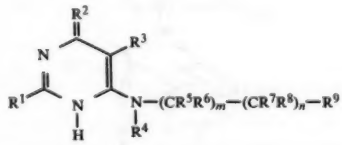
Jehan F. Bagli, Kirkland, Canada, assignor to American Home Products Corporation, New York, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,886

Int. Cl.³ A61K *31/505, 31/535;* **C07D** *239/47, 413/12*

U.S. Cl. 514—26 **33 Claims**

1. A compound of the formula



in which R^1 is lower alkyl, cyclo(lower)alkyl, phenyl(lower)alkyl, or trifluoromethyl; R^2 is oxo, thioxo or imino; R^3 is cyano, aminocarbonyl, nitro, methylsulfonyl or aminosulfonyl; R^4, R^5, R^6, R^7 and R^8 each independently is hydrogen or lower alkyl; R^9 is lower alkenyl, 1-piperidinyl, 1-pyrrolidinyl, 1-piperazinyl, lower alkynyl, cyclo(lower)alkyl, 2, 3 or 4-pyridinyl, 2 or 3-furanyl, 2 or 3-indolyl, 2 or 3-thienyl, 5-imidazolyl, 4-morpholinyl, phenyl, phenyl mono- or disubstituted with hydroxy or lower alkoxy, imidazolyl, 4-thiomorpholinyl, pyrazinyl, pyridazinyl, triazinyl, pyrrolyl, pyrazolyl, thiazolyl, oxadiazolyl, thiadiazolyl, isoxazolyl, oxathiazolyl, quinolinyl, isoquinolinyl, pyridopyrimidinyl, benzoxazolyl, benzimidazolyl, benzthiazolyl, benzoxazinyl, benzpyronyl, or isoindolyl, and m and n each independently is an integer 0 to 2; or a therapeutically acceptable addition salt thereof.

31. A cardiotonic pharmaceutical composition, which comprises a compound of claim **1** and a pharmaceutically acceptable carrier therefor.

4,505,911

ISOINDOLE DIURETIC DERIVATIVES, COMPOSITIONS AND USE

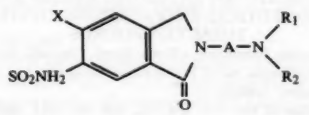
Terence M. Dolak, and Tellis A. Martin, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Oct. 13, 1983, Ser. No. 541,400

Int. Cl.³ A61K *31/40, 31/535;* **C07D** *209/46, 413/06*

U.S. Cl. 514—229 **14 Claims**

1. A compound of Formula I



wherein

X is halogen or trifluoromethyl;

A is alkylene of 2 to 4 carbon atoms;

R_1 is lower alkyl;

R_2 is lower alkyl or phenylalkyl of 7 to 10 carbon atoms;

R_1 and R_2 taken together with nitrogen is piperidino, morpholino or pyridinyl;

or a pharmaceutically acceptable salt thereof.

14. The pharmaceutical composition comprising a diuretic amount of a compound of claim **1** or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutical carrier.

4,505,912

5-ANILINO-1,2,3-TRIAZOLE-4-CARBOXYLIC ACID COMPOUNDS

Werner Kummer; Herbert Köppe; Helmut Stähle, all of Ingelheim am Rhein; Richard Reichl, and Franz J. Kuhn, both of Gau-Algesheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

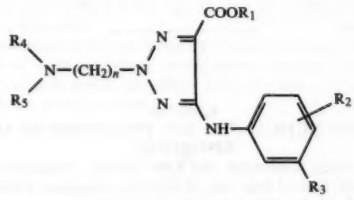
Filed Aug. 20, 1982, Ser. No. 410,008

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 3134842

Int. Cl.³ A61K *31/41;* **C07D** *249/04, 401/06, 413/06*

U.S. Cl. 514—236 **6 Claims**

1. A compound of the formula



wherein

R_1 is straight or branched alkyl of 1 to 4 carbon atoms;

R_2 is hydrogen, halogen, amino, nitro, alkoxy of 1 to 3 carbon atoms, —$COOR_6$, 3-methyl or 4-methyl

R_3 is hydrogen or halogen;

R_4 and R_5 are each alkyl of 1 of 4 carbon atoms or, together with each other and the nitrogen atom to which they are attached, piperidino, pyrrolidino or morpholino;

R_6 is alkyl of 1 to 3 carbon atoms; and

n is 2 or 3;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

6. The method of potentiating the sleep or enhancing blood circulation of a warm-blooded animal in need thereof, which comprises perorally or parenterally administrating to said

animal an effective sleep-potentiating or circulation-enhancing amount of a compound of claim 1.

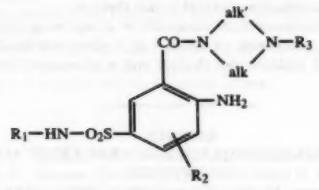
4,505,913

SUBSTITUTED ANTHRANILAMIDES AND PHARMACEUTICAL PREPARATIONS CONTAINING THESE COMPOUNDS

Pier G. Ferrini, Binningen; Alberto Rossi, Oberwil, and Georges Haas, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 254,232, Apr. 14, 1981, abandoned, which is a continuation of Ser. No. 061,791, Jul. 30, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,456
Claims priority, application Switzerland, Aug. 10, 1978, 8525/78
Int. Cl.[3] A61K *31/495;* C07D *241/04, 401/04*
U.S. Cl. 514—183 10 Claims

1. An anthranilamide compound of the formula



(I)

in which R_1 is hydrogen, lower alkyl, cycloalkyl having 5 to 8 ring members, bi- or tricycloalkyl, having 5 or 6 ring members in each ring, R_2 is hydrogen, lower alkyl, lower alkoxy, halogen or trifluoro-methyl, R_3 is hydrogen, lower alkyl, phenyl-lower alkyl or phenyl-lower alkyl substituted in the phenyl moiety by halogen, and alk and alk' are identical or different lower alkylene radicals which separate the nitrogen atoms by 2 or 3 carbon atoms, or a pharmaceutically acceptable salt thereof.

4,505,914

PHARMACEUTICAL FOR THE TREATMENT OF SLEEP DISORDERS

Gunter Metz, Blaubeuren, and Kurt Rauchle, Blaubeuren-Sonderbuch, both of Fed. Rep. of Germany, assignors to Merckle GmbH, Blaubeuren, Fed. Rep. of Germany

Filed Jul. 29, 1983, Ser. No. 518,394
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228351
Int. Cl.[3] A61K *31/495*
U.S. Cl. 514—255 19 Claims

1. A pharmaceutical composition for treatment of sleep disorders comprising a pharmaceutically effective amount of a combination of

(a) at least one compound selected from the group consisting of barbiturates and their pharmaceutically acceptable salts and

(b) a compound selected from the group consisting of cinnarizine, flunarizine and their pharmaceutically acceptable salts, wherein the weight ratio of (a) to (b) is 100:1 to 5:1.

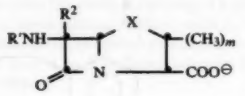
4,505,915

6-N-HETEROCYCLYL PENICILLINS

John Hannah, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

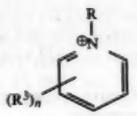
Continuation of Ser. No. 43,085, May 29, 1979, abandoned. This application Mar. 16, 1981, Ser. No. 244,507
The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.
Int. Cl.[3] C07D *499/10;* A61K *31/425*
U.S. Cl. 514—193 5 Claims

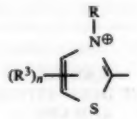
1. A compound having the structure formula:

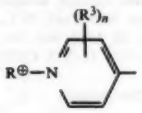


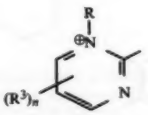
wherein:

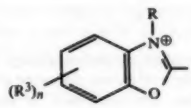
R^2 is hydrogen or methoxyl; m is 0, 1 or 2; X is S, SO, CH_2 or O; R' is selected from the group consisting of:

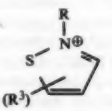


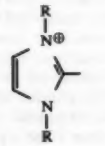












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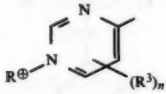
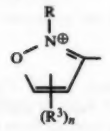
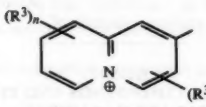
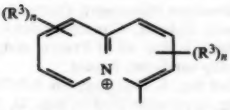
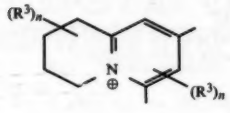
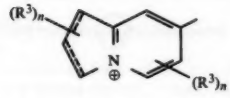


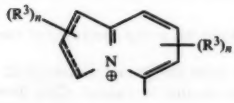












wherein the dotted line indicates both saturated and unsaturated rings; and

wherein:

R is hydrogen, alkyl having from 1–6 carbon atoms, substituted alkyl having from 1–6 carbon atoms wherein the substituent is chloro, fluoro, hydroxyl, alkoxyl (C_{1-6}), carboxyl, amino, sulfo and mono- and dialkylamino wherein each alkyl has 1–6 carbon atoms substituted and unsubstituted phenylaklkyl and phenylalkenyl having 7–12 carbon atoms wherein the substituent is selected from chloro, fluoro, carboxyl, amino, cyano, hydroxyl and sulfo;

R^3 is chloro, fluoro, hydroxyl, carboxyl, sulfo, cyano, amino, mono- and dialkylamino, alkoxyl, alkyl having from 1–6 carbon atoms, substituted alkyl having 1–6 carbon atoms wherein the substituent is carboxyl, cyano, alkoxyl having 1–6 carbon atoms, phenyl and phenyloxy;

n is an integer selected from 0 to 3.

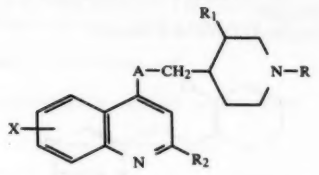
4,505,916

METHOD FOR THE TREATMENT OF PSYCHONEUROTIC STATES BY ADMINISTRATION OF DERIVATIVES OF 2-(4-PIPERIDYL)-1-(4-QUINOLYL)-ETHANONE

Alain A. Champseix, Orsay; Gérard R. Le Fur, Plessis Robinson, and Christian L. A. Renault, Taverny, all of France, assignors to Pharmindustrie, Gennevilliers, France

Division of Ser. No. 212,293, Dec. 2, 1980, Pat. No. 4,433,150.
This application Sep. 29, 1982, Ser. No. 426,545
Claims priority, application France, Dec. 21, 1979, 79 31396
Int. Cl.³ A61K *31/47*
U.S. Cl. 514—314 23 Claims

1. A method for the treatment of states of anxiety in a warm blooded mammal which comprises administering to said mammal a therapeutically effective amount of a compound of the general formulae:



in which R is hydrogen, alkyl having 1 to 4 carbons, or phenyl alkyl of which the alkyl has one or two carbons, R_1 is hydrogen, alkyl having 1 to 4 carbons or alkenyl of 2 to 4 carbons, R_2 is phenyl, pyridyl, thienyl, or phenyl substituted by one substituent taken from the halogens, alkyl and alkoxy having 1 to 4 carbons, X is fixed in position 5, 6, 7 or 8 on the quinoline ring and represents hydrogen or a halogen, or alkyl having 1 to 4 carbons, and A represents CO or CH_2, or an addition salt thereof with a pharmaceutically acceptable acid.

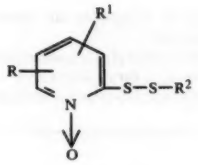
4,505,917

FEED COMPOSITIONS CONTAINING A (1-OXO-2-PYRIDYL) DISULFIDE

Govind K. Menon, Downingtown, Pa., and Winfred J. Sanders, Mt. Holly, N.J., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Sep. 21, 1982, Ser. No. 420,678
Int. Cl.³ C07D *213/62, 211/72, 211/84;* A01N *43/40*
U.S. Cl. 514—347 16 Claims

1. The method of improving the weight gain and feed efficiency of meat-producing monogastric animals comprising feeding to said animals an effective but nontoxic quantity of a compound of the formula:



in which:

R and R^1 are, each, hydrogen, C_{1-6}-alkyl, C_{1-6}-alkoxy, C_{1-6}-alkylthio, nitro, hydroxy, halo, carboxy, phenyl, benzyl or benzylthio; and

R^2 is a phenyl, benzyl, pyridyl, 1-oxo-pyridyl, each of the former has one or two optional substituents as defined for R and R^1 above, C_{1-12}-alkyl, furyl, thienyl, glucosyl, alanyl, C_{3-12}-alkenyl or carboxy-C_{1-6}-alkyl; or a nontoxic, stable salt thereof.

6. An animal feed composition supplemented by a quantity

of a compound as defined in claim 1 which is effective for increasing the growth rate and feed efficiency of a meat producing monogastric animal but which is nontoxic to said animal.

4,505,918

4-[2-PYRIDINYLTHIO(OXY OR AMINO)METHYL]-1H-IMIDAZOLES AND DERIVATIVES

Joel R. Huff, Lederach; Walfred S. Saari, Lansdale, and John J. Baldwin, Gwynedd Valley, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

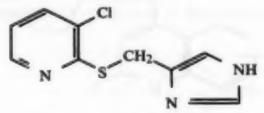
Filed Nov. 8, 1982, Ser. No. 439,698

The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.

Int. Cl.[3] **C07D** *401/12;* **A61K** *31/415*

U.S. Cl. 514—341 **3 Claims**

1. A compound of structural formula



or a pharmaceutically acceptable salt thereof.

4,505,919

ANTIFUNGAL S-ARYLMETHYL- AND S-HETEROCYCLYLMETHYL ETHERS OF 2-ARYL-3-MERCAPTO-1-(1H-1,2,4-TRIAZOL-1-YL) PROPAN-2-OLS

Kevin Cooper, Ramsgate; Kenneth Richardson, and Peter J. Whittle, both of Canterbury, all of England, assignors to Pfizer Inc., New York, N.Y.

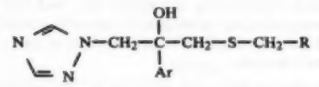
Filed Mar. 28, 1983, Ser. No. 479,526

Claims priority, application United Kingdom, Oct. 9, 1982, 8228920

Int. Cl.[3] **C07D** *401/10;* **A61K** *31/44*

U.S. Cl. 514—340 **8 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof wherein Ar is 2,4-dichlorophenyl; and

R is phenyl, chlorophenyl, C_{1-4} alkoxyphenyl, C_{2-5} alkoxycarbonylphenyl, 2-furyl, 2-pyridyl, 1-methylimidazol-2-yl, 1-methyltetrazol-5-yl and 2-aminothiazol-4yl.

4,505,920

CERTAIN N-SUBSTITUTED-4-ARYL-3,5-PYRIDINE DICARBOXYLATES AND THEIR ANTIHYPERTENSIVE USE

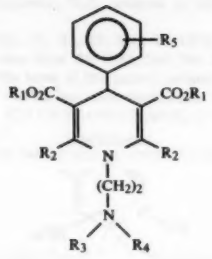
Bernard Loev, Scarsdale; Howard Jones, Ossining, both of N.Y., and John T. Suh, Greenwich, Conn., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,916

Int. Cl.[3] **C07D** *403/06;* **A61K** *31/455*

U.S. Cl. 514—341 **10 Claims**

1. A compound of the formula



wherein,

R_1 is C_1–C_3 alkyl,

R_2 is C_1–C_6 alkyl,

R_5 is H, hydroxy, nitro, cyano, C_1–C_7 alkoxy, trifluoromethyl, C_1–C_7 alkyl, halo, or phenyl, and

wherein N, R_3 and R_4 together form 1-pyrrolyl, 1-(3,5-dimethylpyrazolyl) or 1-pyrazolyl and pharmaceutically acceptable acid addition salts thereof.

4,505,921

SULFONYLUREA COMPOUNDS AND THEIR USE IN TREATING DIABETES

Laszlo Beregi, Boulogne Billancourt; Pierre Hugon, Rueil Malmaison; Jacques Duhault, Croissy-sur-Seine, and Michelle Boulanger, Marly le Roi, all of France, assignors to ADIR, S.A.R.L., Neuilly-sur-Seine, France

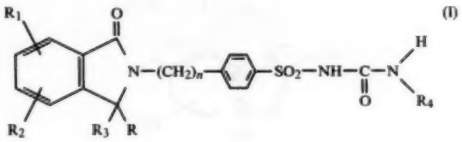
Filed Sep. 6, 1983, Ser. No. 529,735

Claims priority, application France, Sep. 23, 1982, 82 16012

Int. Cl.[3] **A61K** *31/395;* **C07D** *519/00*

U.S. Cl. 514—212 **6 Claims**

1. A compound selected from the group consisting of sulfonylurea compounds of the formula I:

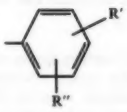


(I)

in which

n is selected from the group consisting of the integers 1 and 2;

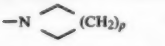
R is selected from the group consisting of: thienyl, furyl, pyridyl radicals and the radical of the formula:



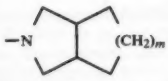
in which R′ and R″ which are the same or different are each selected from the group consisting of a hydrogen atom, halogen atoms, such as, for example, chlorine, fluorine and bromine atoms, a hydroxy radical, alkyl and alkoxy radicals each having from 1 to 4 carbon atoms inclusive, a trifluoromethyl radical and R′ and R″ together form a $—CH_2—O—CH_2—$ *group;*

R_1 and R_2 which are the same or different are each selected from the group consisting of a hydrogen atom, halogen atoms, such as, for example, chlorine, fluorine and bromine, alkyl and alkoxy radicals each having from 1 to 5

carbon atoms inclusive and a trifluoromethyl radical, and
R_1 and R_2 together form a $—CH_2—O—CH_2—$ group;
R_3 is selected from the group consisting of a hydrogen atom and a hydroxy radical, and
R_4 is selected from the group consisting of alkyl radicals each having from 1 to 5 carbon atoms, cycloalkyl radicals having from 3 to 8 carbon atoms, azacycloalkyl radicals of the formula:



in which p is selected from the group consisting of zero and the integers from 1 to 5,
and azabicycloalkyl radicals of the formula:



in which m is selected from the group consisting of 1, 2 and 3, and
physiologically tolerable basic addition salts thereof.

4,505,922

TRIAZOLEALKYNOL FUNGICIDAL AGENTS

Gerhard Jäger, Leverkusen; Karl H. Büchel, Burscheid; Wolfgang Krämer, Wuppertal; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

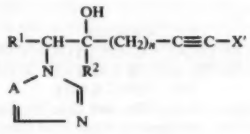
Filed Jun. 7, 1982, Ser. No. 385,354

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 3124580

Int. Cl.[3] **A01N** *43/50, 43/64;* **C07D** *233/60, 249/08*

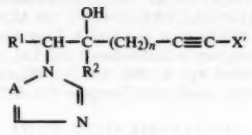
U.S. Cl. 514—383 **15 Claims**

1. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of an alkinyl-azole derivative of the formula



in which
A is a nitrogen atom or the CH group,
R^1 is an aryloxy group,
R^2 is an alkyl group having 1 to 4 carbon atoms which is optionally substituted by halogen, or an aryl group, the aryl or aryloxy groups of R^1 and R^2 being phenyl or naphthyl optionally substituted by halogen, alkyl having 1 to 4 carbon atoms, nitro, halogenoalkyl having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, or phenyl which is optionally substituted by halogen,
X' is a hydrogen, bromine or iodine atom, and n is 0 or 1,
or an acid addition salt or metal salt complex thereof.

12. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of an alkinyl-azole derivative of the formula



in which
A is a nitrogen atom or the CH group,
R^1 is an aryl group,
R^2 is an alkyl group having 1 to 4 carbon atoms which is optionally substituted by halogen, or an aryl group, the aryl groups of R^1 and R^2 being phenyl or naphthyl optionally substituted by halogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, nitro, halogenoalkyl having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, or phenyl which is optionally substituted by halogen,
X' is a bromine or iodine atom, and
n is 0 or 1,
or an acid addition salt or metal salt complex thereof.

4,505,923

ETHERS OF HYDROXYBENZOTHIAZOLE-2-SULFONAMIDE FOR THE TOPICAL TREATMENT OF ELEVATED INTRAOCULAR PRESSURE

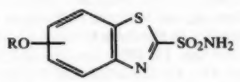
Jacob M. Hoffman, Jr., North Wales, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 31, 1983, Ser. No. 547,189

Int. Cl.[3] **C07D** *277/80;* **A61K** *31/425*

U.S. Cl. 514—229 **9 Claims**

1. A compound of structural formula:



or ophthalmologically acceptable salt thereof wherein R is
(1) C_{1-5}alkyl substituted with one or more of:
(a) hydroxy,
(b) C_{1-3}alkoxy,
(c) halo,
(d)

wherein R^1 and R^2 are independently selected from
(1) hydrogen,
(2) C_{1-5}alkyl or
(3) R^1 and R^2 joined together directly or through a hetero-atom selected from O, N or S to form a 5 or 6-membered heterocycle with the nitrogen to which they are attached, wherein the heterocycle is selected from pyrrolidino, piperidino, morpholino and thiazolidino,
(e) C_{2-4}alkanoyloxy,
(f) oxiranyl,
(g) carboxy, or
(h) C_{1-3}alkoxycarbonyl; or
(2) C_{2-5}alkenyl.

4,505,924

PHARMACEUTICAL PREPARATION FOR THE TOPICAL TREATMENT OF ACNE

Peter Taylor, Windlesham, and Alan A. Levy, Stanmore, both of England, assignors to Richardson-Vicks Ltd., Great Britain

Filed Apr. 6, 1983, Ser. No. 482,420
Claims priority, application European Pat. Off., May 3, 1982, 82103791.8
Int. Cl.³ A61K *31/255, 31/415*
U.S. Cl. 514—399 13 Claims

1. A pharmaceutical preparation for the topical treatment of acne in humans comprising a pharmaceutically acceptable carrier and a synergistic combination of Imazalil or an acid addition salt thereof and hexamidine isethionate in the range of from approximately 100:1 to approximately 10:1 parts by weight respectively.

4,505,925

N,N-DIETHYL-5-METHYL-2H-1-BENZOTHIOPYRANO-4,3,2-CD-INDAZOLE-2-ETHANAMINE COMPOSITIONS AND METHODS FOR THEIR USE

Edward F. Elslager, and Leslie M. Werbel, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 20, 1983, Ser. No. 496,612
Int. Cl.³ A61K *31/415*
U.S. Cl. 514—405 2 Claims

1. A method of treating lower warm blooded animal tumors comprising: administering to a lower warm blooded animal in need of such treatment a tumor inhibiting amount of a pharmaceutical composition containing as active component N,N-diethyl-5-methyl-2H-1-benzothiopyrano(4,3,2-cd)indazole-2-ethanamine in free base form or a pharmaceutically acceptable salt form.

4,505,926

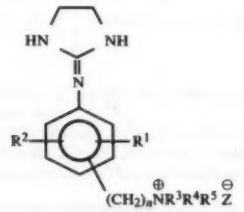
QUATERNARY AMINO IMIDAZOLIDINES, COMPOSITIONS AND USE

Peter M. Newsome, Cheam; Stephen F. Moss, Carshalton; Lee J. Beeley, Dorking, and Malcolm N. Burgess, Horsham, all of England, assignors to Beecham Group p.l.c., England

Filed Sep. 15, 1983, Ser. No. 532,525
Int. Cl.³ A61K *31/415;* C07D *233/50*
U.S. Cl. 514—398 7 Claims

1. A compound of formula (I):

(I)



wherein

R^1 and R^2 are the same or different and each is selected from halogen, alkyl, haloalkyl, alkoxy and alkoxyalkyl,

R^3, R^4 and R^5 are the same or different and each is alkyl;

n is 0,1,2 or 3; and

Z is a pharmaceutically or veterinarily acceptable anion, and salts thereof.

7. A method for treating or preventing diarrhoea and scours in a human or non-human animal comprising administering an antidiarrhoeally effective, non-toxic amount of a compound as defined in claim 1 to the human or non-human animal.

4,505,927

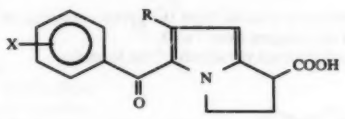
5-BENZOYL-1,2-DIHYDRO-3H-PYRROLO[1,2-A]PYRROLE-1-CARBOXYLIC ACIDS AND PHARMACEUTICAL USE THEREOF

Joseph M. Muchowski, Sunnyvale, Calif., and Robert Greenhouse, Los Reyes, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 198,551, Oct. 20, 1980, Pat. No. 4,347,189.
This application Jan. 15, 1982, Ser. No. 339,813
Int. Cl.³ C07D *487/06;* A61K *31/40*
U.S. Cl. 514—413 3 Claims

1. A compound of the formula

(VI)



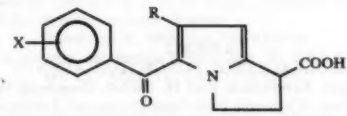
wherein

R is hydrogen or lower alkyl;

X is lower alkoxycarbonyl, carboxyl or lower alkylcarbonyl; and the pharmaceutically acceptable non-toxic estersand salts thereof.

3. A method of treating inflammation, pain or pyrexia in mammals which comprises administering to a subject in need of such treatment, an effective amount of the compound of the formula,

(VI)



wherein

R is hydrogen or lower alkyl; and

X is lower alkoxycarbonyl, carboxyl or lower alkylcarbonyl; or a pharmaceutically acceptable non-toxic ester or salt thereof, or a pharmaceutical composition containing an effective amount of said compound or a pharmaceutically acceptable non-toxic alkyl ester or salt thereof.

4,505,928

PHARMACEUTICAL COMPOSITION CONTAINING CIS-PLATINUM (II) AMINE LACTATE AND A METHOD OF USING SAME

Alan R. Amundsen, Somerville, and Eric W. Stern, Mountainside, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation-in-part of Ser. No. 178,670, Aug. 18, 1980, abandoned, which is a division of Ser. No. 50,235, Jun. 20, 1979, abandoned. This application Dec. 18, 1981, Ser. No. 332,112
Claims priority, application Canada, Jun. 12, 1980, 353897; Australia, Jun. 18, 1980, 59368
Int. Cl.³ A61K *31/28*
U.S. Cl. 514—492 23 Claims

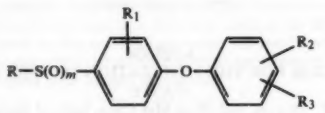
13. A method of treating malignant animal tumor cells sensitive to cis-$[Pt(II)A_2(C_3H_5O_3)_2]$ which comprises administering to an animal afflicted with said tumor cells an amount of cis-$[Pt(II)A_2(C_3H_5O_3)_2]$ sufficient to cause regression of the animal tumor cells, wherein Pt is in valance state II and is coordinated to A in a cis configuration, A is ammonia or a monodentate alkylamine or A_2 is a bidentate alkylenediamine, and $C_3H_5O_3$ is a lactate anion.

4,505,929
SULFUR-SUBSTITUTED DIPHENYL ETHERS HAVING ANTIVIRAL ACTIVITY

Lowell D. Markley, Midland, Mich.; Yulan C. Tong, Walnut Creek, Calif., and Steven G. Wood, Orem, Utah, assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 158,964, Jun. 12, 1980, Pat. No. 4,349,568. This application Aug. 16, 1982, Ser. No. 408,362
Int. Cl.³ A01N *37/34;* C07C *121/50, 143/78, 143/74*
U.S. Cl. 514—520 18 Claims

1. A compound corresponding to the formula:



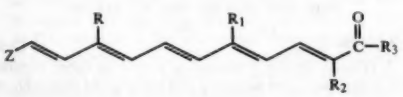
wherein m represents the integer 0, 1 or 2; R represents trihalomethyl, alkyl or phenyl; R_1 represents hydrogen, bromo, chloro, fluoro, amino, alkyl, alkoxy or trifluoromethyl; R_2 represents hydroxyl, bromo, chloro, fluoro, acetyl, benzoyl, substituted benzoyl, alkyl, alkoxy, substituted alkoxy, benzyl, substituted benzyl, alkylthio, alkylsulfinyl, alkylsulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, or the radical $-O(CH_2)_nR_4$ wherein n represents the integer 1, 2 or 3; and R_4 represents cyano; R_3 represents hydrogen, hydroxyl, bromo, chloro, fluoro, acetyl, benzoyl, substituted benzoyl, alkyl, alkoxy, substituted alkoxy, benzyl, substituted benzyl, alkylthio, alkylsulfinyl, alkylsulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, or the radical $-O(CH_2)_nR_4$ wherein n represents the integer 1, 2 or 3; and R_4 represents cyano; with the proviso that at least one of R_2 and R_3 must be alkylaminosulfonyl, dialkylaminosulfonyl or the radical $-O(CH_2)_nR_4$.

4,505,930
ALPHA-ALKYL POLYOLEFINIC CARBOXYLIC ACIDS AND DERIVATIVES THEREOF USEFUL IN THE TREATMENT OF PSORIASIS AND ALLERGIC RESPONSES

Bernard Loev, Scarsdale; Wan-Kit Chan, Yorktown Heights, and Howard Jones, Ossining, all of N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 392,837, Jun. 28, 1982, Pat. No. 4,472,438. This application Jul. 8, 1983, Ser. No. 511,822
Int. Cl.³ A61K *31/16, 31/20, 31/23;* A61L *9/04*
U.S. Cl. 514—529 18 Claims

1. A therapeutic composition for the treatment of inflammatory conditions and allergic responses, in combination with at least one pharmaceutically-acceptable extender, at least one polyolefinic compound of the general formula



in which R and R_1 are each hydrogen or an alkyl group of from 1 to 5 carbon atoms; R_2 is an alkyl group of from 1 to 5 carbon atoms; R_3 is hydroxyl, alkoxy of from 1 to 5 carbon atoms, NH_2, NHR_2 or NR_2R_2 and Z is a cycloalkyl, cycloalkenyl or cycloalkdienly group substituted with from 0 to 5 alkyl groups, a keto group or a hydroxyl group or a phenyl group substituted with from 0 to 4 hydroxy, alkoxy, alkyl or trifluoromethyl groups or halogen atoms or combinations thereof and the pharmaceutically-acceptable salts thereof;

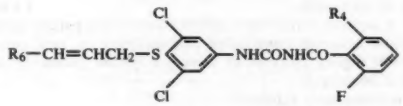
wherein said pharmaceutically—acceptable extender is in the form of tablets, capsules or solutions for oral administration; solutions for parenteral administration; dusting powders, aerosol sprays, ointments, creams and lotions for topical administration.

4,505,931
PESTICIDAL N-(4-ALKENYLTHIO)-PHENYL-N'-BENZOYLUREAS

Josef Ehrenfreund, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 24, 1980, Ser. No. 114,934
Claims priority, application Switzerland, Feb. 1, 1979, 983/79; Oct. 15, 1979, 9261/79
Int. Cl.³ A01N *47/28;* C07C *127/22*
U.S. Cl. 514—594 5 Claims

1. A compound of the formula



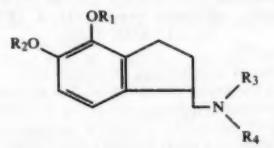
wherein
R_6 is chloro or bromo and
R_4 is hydrogen or fluoro.

4,505,932
METHOD OF PRODUCING α_2-ADRENERGIC RECEPTOR AGONIST ACTIVITY

John F. DeBernardis, Lake Villa, and David L. Arendsen, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 494,230, May 13, 1983, abandoned. This application Mar. 19, 1984, Ser. No. 590,938
Int. Cl.³ A61K *31/135;* C07C *91/42*
U.S. Cl. 514—649 6 Claims

1. A method of producing α_2-adrenergic receptor agonist activity comprising administering to an animal in need of said activity production, an amount of a compound of the formula



wherein R_1, R_2, R_3 and R_4 are independently selected from hydrogen or loweralkyl of 1 to 2 carbon atoms, or a pharmaceutically acceptable salt thereof, sufficient to produce said activity.

4,505,933

FATTY ALDEHYDES IN THE TREATMENT OF MULTIPLE SCLEROSIS

Wilhelm Hörrmann, Obb, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 303,634, Feb. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 127,817, Mar. 6, 1980, abandoned, which is a continuation-in-part of Ser. No. 787,902, Apr. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 652,309, May 3, 1976, abandoned, which is a continuation-in-part of Ser. No. 600,375, Jul. 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 450,458, Mar. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 274,754, Jul. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 805,934, Feb. 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 634,884, May 1, 1967, abandoned, which is a continuation-in-part of Ser. No. 412,862, Nov. 20, 1964, abandoned, which is a continuation-in-part of Ser. No. 211,827, Jul. 23, 1962, abandoned, which is a continuation-in-part of Ser. No. 824,798, Jul. 3, 1959, abandoned, which is a continuation-in-part of Ser. No. 029,850, Apr. 18, 1959, abandoned, which is a continuation-in-part of Ser. No. 907,343, May 18, 1958, abandoned. This application Mar. 1, 1983, Ser. No. 470,970

Int. Cl.[3] A61K *31/12*

U.S. Cl. 514—693 1 Claim

1. A method of treating multiple sclerosis in a patient having multiple sclerosis comprising administering to said patient 100–400 mg/kg daily of at least one of the geometric and optical isomers of

6-n-dodecenoic aldehyde

8-n-hexadecenoic aldehyde

and 6,1 2-n-octadecadienoic aldehyde or

8,1 6n-tetracosadienoic-2-hydroxy aldehyde

per se or as an ether of glycol, glycerol or physiologic acids of bile or in form of plasmalogen, said isomer being diluted in plant oils or in the form of capsule or emulsion.

4,505,934

INSECTICIDE COMPOSITION, ITS PREPARATION AND ITS USE

Jiri Gut, Delft, and Adriaan M. van Oosten, Maassluis, both of Netherlands, assignors to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Aug. 11, 1982, Ser. No. 407,042

Claims priority, application Netherlands, Aug. 21, 1981, 8103905

Int. Cl.[3] A01N *27/00*

U.S. Cl. 514—762 4 Claims

1. A process for killing aphids comprising contacting the aphids with an amount of (E)-β-farnesene effective to kill aphids.

4,505,935

PROTECTIVE LAYER ON SKIN, MUCOUS MEMBRANE OR OTHER BODY TISSUE

Viktor K. Larsson, Kämpagränd 5C, S 223 76 Lund, Sweden

Continuation of Ser. No. 147,741, May 8, 1980, abandoned. This application Aug. 20, 1982, Ser. No. 409,972

Claims priority, application Sweden, May 8, 1979, 7904028

Int. Cl.[3] A61K *47/00*

U.S. Cl. 514—779 7 Claims

1. A method of producing a protective layer on a surface selected from the group consisting of skin and mucous membrane, said method comprising providing an ointment which comprises 70–90 percent by weight of an aqueous phase, 1–7 percent by weight of a water soluble salt of alginic acid having an average molecular weight of from 15,000 to 90,000 and 8–25 percent by weight of hydrophilic lipid crystals dispersed in said aqueous phase, said hydrophilic lipid crystals being selected from the group consisting of an alpha monoglyceride of a saturated fatty acid having 12–18 carbon atoms in the carbon chain, a glycerol monoether of a saturated fatty alcohol having 12–18 carbon atoms in the carbon chain, and an alkali metal salt of a phosphate ester of a saturated fatty alcohol having 12–18 carbon atoms in the carbon chain, applying said ointment to said surface, and contacting said ointment on said surface with an aqueous solution of a water-soluble calcium salt, said solution containing a concentration of calcium salt sufficient to convert at least said water soluble salt in the upper portion of said ointment on said surface to an insoluble calcium salt of alginic acid.

4,505,936

PROCESS FOR THE UTILIZATION OF SHELLFISH WASTE

Samuel P. Meyers, and Huei-Mei Chen, both of Baton Rouge, La., assignors to Louisiana State University, Baton Rouge, La.

Filed Sep. 14, 1983, Ser. No. 532,179

Int. Cl.[3] A22C *29/02;* A23K *1/10*

U.S. Cl. 426—1 17 Claims

1. A process for the extraction with an edible oil of astaxanthin from a crustacean waste comprising chitinous shell and proteinaceous tissue to produce an astaxanthin enriched dietary food supplement with significant pigment concentration, which comprises

comminuting the crustacean waste in an attrition mill to tear and separate the soft proteinaceous tissue from the chitinous shell, separating the chitinous shell from the remaining proteinaceous puree,

acidifying the proteinaceous puree with an acid to a pH ranging from about 4 to about 5.5,

adding an edible oil to the acidified proteinaceous puree in concentration ranging from about 8 percent to about 14 percent, based on the weight of the puree,

cooking the edible oil-containing acidified puree at a temperature ranging from about 170° F. to about 200° F. for a time sufficient to disassociate the protein-carotenoid bonds of the astaxanthin pigment and obtain a cooked oil homogenate, and

separating the cooked oil homogenate into a demineralized chitinous solids effluent, and an astaxanthin enriched oil pigment and flavored water extract.

4,505,937

METHOD OF PASTEURIZING VEGETABLES FOR MARKETING

Jean R. Demeulemeester, and Jean-Marc Demeulemeester, both of La Jacobée, Trevoux (Ain), France

Filed Nov. 18, 1982, Ser. No. 442,784

Int. Cl.[3] C12H *1/00*

U.S. Cl. 426—8 13 Claims

1. A process for the treatment of a root or tuber vegetable which comprises, after selecting and peeling the vegetable, the steps of:

(a) slightly pasteurizing the vegetable at a temperature between 75° and 85° C.;

(b) subjecting the slightly pasteurized vegetable to vacuum conditioning in plastic pouches;

(c) incubating the vegetable in the plastic pouches after vacuum conditioning to promote a vegetative state of spores and bacteria in the vegetable by maintaining the pouches in a closed condition in a vessel at an incubation temperature between 25° and 35° C.;

(d) pasteurizing the incubated vegetable at a temperature of 85° to 90°; and

(e) refrigerating the vegetable pasteurized in step (d).

4,505,938

PROCESS FOR PRODUCING A SEASONING

Hideo Togawa, Enzan; Taihei Takezawa, Otsuki; Masazumi Watanabe, Kashiwa; Kazuya Hayashi, Kashiwa, and Akira Okuhara, Kashiwa, all of Japan, assignors to Kikkoman Corporation, Noda and Mann's Wine Co., Ltd., Tokyo, both of, Japan

Filed May 16, 1983, Ser. No. 494,613
Claims priority, application Japan, May 21, 1982, 57-84988
Int. Cl.³ A23L *1/238, 1/23, 1/205*
U.S. Cl. 426—46 3 Claims

1. A process for producing a seasoning which comprises adding a matured fruit wine must or a fruit wine to a matured soy sauce moromi mash or a raw soy sauce in an amount of 3–20% based on the matured soy sauce moromi mash or raw soy sauce, and aging the mixture at room temperature for 3–20 days to expect their mutual interaction.

4,505,939

TAR-DEPLETED LIQUID SMOKE TREATED FOOD CASING

Herman S. Chiu, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 417,171, Sep. 14, 1982, abandoned, which is a continuation-in-part of Ser. No. 312,364, Oct. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 62,358, Jul. 31, 1979, abandoned. This application Nov. 30, 1983, Ser. No. 556,442
Int. Cl.³ A22C *13/00*
U.S. Cl. 426—135 18 Claims

1. A tar-depleted liquid smoke treated tubular food casing having a tar-depleted liquid smoke coating which is derived from a tar-containing liquid smoke and which provides said casing with an absorptive index of at least about 0.2 at 340 nm. wave length, and which also provides said casing with a liquid smoke extract having an absorbance at 210 nm. wave length which is no more than about 60% of the absorbance for a similar extract from an identical casing having a comparable coating of said tar-containing liquid smoke sufficient to provide substantially the same absorptive index as said tar-depleted liquid smoke treated tubular food casing.

4,505,940

NON-CAFFEINE SOLIDS RECOVERY PROCESS

Gary V. Jones, Tarrytown, N.Y.; James F. Meinhold, Boonton, N.J., and Joseph A. Musto, Bronx, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,460
Int. Cl.³ A23F *5/22*
U.S. Cl. 426—424 5 Claims

1. A method for producing a decaffeinated coffee product comprising the steps of:

(a) contacting an aqueous, caffeine-containing roasted coffee extract with a halogenated caffeine solvent in a liquid-liquid extraction column at a weight ratio of caffeine solvent to extract of from 1:1 to 10:1 at a temperature of from 26.7° C. to 82.2° C. for a time and under conditions effective to transfer at least 90% of the caffeine contained in the extract from the aqueous phase to the caffeine solvent phase, said contact also inherently effecting transfer of a minor amount of non-caffeine roasted coffee solids from the aqueous phase to the caffeine solvent phase, and separating the two phases;

(b) contacting said caffeine and non-caffeine solids-containing caffeine solvent phase with water in a liquid-liquid extraction column at a weight ratio of water to said caffeine solvent phase of 0.25–3:1, at a temperature of from 5° C. to 43.3° C. and for a time and under conditions effective to transfer at least 70% of the non-caffeine solids from the caffeine solvent phase to the water phase while retaining at least 90% of the caffeine in the caffeine solvent phase, and separating the two phases;

(c) combining the decaffeinated aqueous coffee extract phase from step (a) and the non-caffeine solids-containing water phase from step (b); and

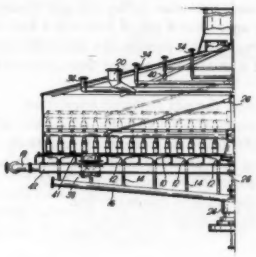
(d) removing entrained solvent from the separate aqueous and water phases or the combined liquid of step (c) in order to effect a residual solvent content in the combined liquid of less than 10 ppm.

4,505,941

LAUTER TUNS

David W. Raines, Tutbury, England, assignor to Robert Morton DG Limited, England

Filed May 6, 1981, Ser. No. 261,004
Claims priority, application United Kingdom, May 7, 1980, 8015138
Int. Cl.³ A23L *1/28;* C12G *1/02*
U.S. Cl. 426—489 8 Claims



7. A method of forming wort liquor in a brewing process, said method comprising the steps of

providing a lauter tun in which the bottom wall of said tun is comprised of a series of straight valleys formed integral with said bottom wall, said valleys extending in parallel fashion one with another throughout the breadth of said tun, and said valleys each extending across said bottom wall between opposite points on the side walls of said tun,

establishing a bed of mash on top of a filter plate positioned within said tun, said filter plate being spaced above the bottom wall of said tun,

filtering wort liquor through said mash bed on said filter plate,

collecting said wort liquor in said spaced parallel, straight valleys, and

draining said wort liquor from said valleys at at least one location within each valley, said wort liquor being drained into a wort manifold positioned beneath the bottom wall of said tun.

4,505,942

MANUFACTURE OF SNACK FOODS

Hideaki Ito, No. 8-19, Kita 2-chome, Okegawa-shi, Saitama-ken, and Haruo Ito, No. 4-29, Amagasuka 4-chome, Yokkaichi-shi, Mie-ken, both of Japan

Filed Nov. 30, 1983, Ser. No. 556,278
Int. Cl.³ A23L *1/01*
U.S. Cl. 426—551 7 Claims

1. A method for making a base material for a snack food which comprises mixing 100 parts of bean-curd refuse with 120 to 180 parts of wheat flour, 30 to 70 parts starch, and 12 to 28 parts water, steaming and boiling the resulting mixture into a rice-cake state, forming the mixture into a sheet, cooling and maturing the mixture, and drying the matured mixture to produce a base material having a water content of 13 to 20%.

4,505,943
PROCESS FOR MAKING A FREEZE-THAW STABLE EDIBLE FOAM CONTAINING MILK FAT

William J. Dell, Howell, N.J.; Alexander A. Gonsalves, Yardley, Pa., and William E. Flango, Hamilton Square, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 446,282, Dec. 2, 1982, abandoned. This application Jul. 9, 1984, Ser. No. 627,508
Int. Cl.[3] A23C *13/14;* A23G *9/02*
U.S. Cl. 426—565 13 Claims

1. A process for making a frozen, milk fat-containing edible whipped topping, said whipped topping being both freeze-thaw stable and refrigerator stable after thawing for a period of at least seven days, comprising the steps of:

(a) preparing an admixture comprised of from 35 to 65% by weight water, from 10 to 30% by weight fat, wherein at least about 11% of the fat is milk fat and at least about 50% of the fat is non-milk fat, from 0.5 to 3.5% by weight protein, from 0.02 to 2% by weight gum stabilizer, emulsifier, sweetner and an alkalizing or buffering agent, wherein said admixture in the absence of said alkalizing or buffering agent has a pH of below 6.3 and said alkalizing or buffering agent is present at a level effective to raise the pH of the admixture to greater than about 6.5 but less than 7.2;

(b) pasteurizing the pH adjusted admixture;

(c) homogenizing the pH adjusted admixture at a pressure of at least 6000 psi so as to form an emulsion;

(d) whipping and aerating said emulsion to an overrun of between about 200% and about 300%;

(e) cooling the aerated emulsion; and

(f) freezing the aerated emulsion.

4,505,944
FUGITIVE INK COMPOSITION

John D. Turner, Raleigh, N.C., assignor to Cotton Incorporated, New York, N.Y.

Filed Aug. 1, 1983, Ser. No. 518,970
Int. Cl.[3] B05D *7/24*
U.S. Cl. 427—8 16 Claims

1. A fugitive ink composition for marking fibrous material, comprising:

(a) a dark organic pigment that comprises a complex between a polyvalent metal and tannic acid; and

(b) a binding agent which is insoluble in water at a pH of about 7 and at a temperature in the range of from 0° to 100° C., and has a T_{300} temperature in the range of from about 5° to about 150° C.,

wherein the ratio of the weight of said pigment to the weight of said binding agent ranges from about 1.0:0.2 to about 1:10, and wherein said ink composition substantially decolorizes upon subsequent processing comprising mechanical agitation of said marked fibrous material.

13. A process of providing and removing a fugitive mark on fibrous material comprising the steps of:

(a) contacting said fibrous material with a fugitive ink composition comprising:

(i) a dark organic pigment that comprises a complex between a polyvalent metal and tannic acid; and

(ii) a binding agent, which is insoluble in water at a pH of about 7 and at a temperature in the range of from 0° to 100° C., and has a T_{300} temperature in the range of from about 5° to about 150° C., wherein the ratio of the weight of said pigment to the weight of said binding agent ranges from about 1.0:0.2 to about 1:10,

so as to provide an identification mark on said fibrous material, wherein said identification mark decolorizes when said fibrous material is subjected to subsequent processing;

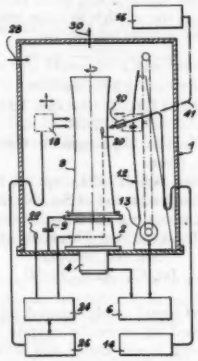
(b) drying said fugitive ink composition to provide marked fibrous material; and

(c) processing the marked fibrous material to substantially decolorize the ink composition, said processing comprising mechanical agitation of the marked fibrous material.

4,505,945
PROCESS AND APPARATUS FOR COATING A MEMBER BY PLASMA SPRAYING

Jean-Claude Dubust, Limours; Marcel Boncoeur, Paris, and Bernard Hansz, Vertle Petit, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 30, 1984, Ser. No. 605,611
Claims priority, application France, Apr. 29, 1983, 83 07165
Int. Cl.[3] B05D *1/08*
U.S. Cl. 427—8 24 Claims



1. A process for coating a member by plasma spraying using a spray gun which is movable relative to the said member, the operation taking place under a controlled atmosphere within a tight enclosure wherein the pressure and composition of the atmosphere prevailing in the enclosure are maintained constant, the member is cooled in order to regulate the temperature of the different points thereof in accordance with a predetermined program, said operation being carried out with the aid of a cooling system which is movable with respect to said member, and wherein the relative displacements of the member, gun and cooling system are controlled automatically.

7. An apparatus for coating a member by plasma spraying, wherein it comprises a tight enclosure containing a movable support for the member to be coated, a plasma spray gun movable with respect to said member, a cooling system which is also movable relative to said member, temperature sensors for checking the temperature of the member and of the atmosphere prevailing in the enclosure, as well as means for analyzing the gas in the enclosure, means for scavenging the enclosure with the aid of a gas and a device for synchronizing the relative movements of the member, the gun and the cooling system.

4,505,946
METHOD FOR COATING METAL WITH A DISSIMILAR METAL

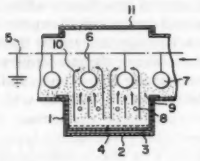
Michihiko Suzuki; Katsukiyo Kawaguchi, both of Tokai, and Yoshihiko Kojima, Chita, all of Japan, assignors to Aichi Steel Works, Limited, Aichi, Japan

Filed Nov. 30, 1981, Ser. No. 325,903
Claims priority, application Japan, Dec. 2, 1980, 55-170093; May 12, 1981, 56-71068
Int. Cl.[3] B05D *1/04, 1/06*
U.S. Cl. 427—29 6 Claims

1. A method for coating metal with a dissimilar metal comprising the steps of:

(a) preheating a surface of a parent metal selected from the group consisting of iron, titanium, aluminum and an alloy

thereof at least to a temperature at which substitution of a halide metal selected from the group consisting of copper chloride, tin chloride, zinc chloride, tin iodide, copper bromide effect substitution of said halide metal at said surface of said parent metal;



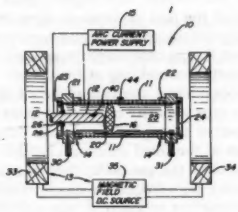
(c) cooling the resulting product;
(d) removing a residue of said halide metal from said product.

4,505,947

METHOD FOR THE DEPOSITION OF COATINGS UPON SUBSTRATES UTILIZING A HIGH PRESSURE, NON-LOCAL THERMAL EQUILIBRIUM ARC PLASMA

Vladimir Vukanovic; Susannah M. Butler; George Fazekas, and John R. Miller, all of Rochester, N.Y., assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Jul. 14, 1982, Ser. No. 398,005
Int. Cl.³ B05D *1/08*
U.S. Cl. 427—34 **52 Claims**



1. A method for coating substrates comprising generating a non-LTE arc plasma at a pressure graater than about 0.1 atmospheres, said plasma being generated by the flow of a current of from about 2 to about 10 amps between a cathode and an anode proximate to the cathode, a voltage of from about 20 volts to about 200 volts being impressed across the cathode and the anode;
introducing a coating material into the arc plasma;
positioning a substrate material proximate to the arc plasma, whereby activated species of said coating material formed by the arc plasma contact the substrate to form a coating.

4,505,948

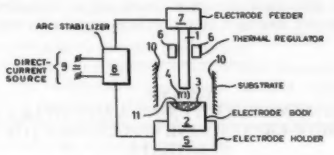
METHOD OF COATING CERAMICS AND QUARTZ CRUCIBLES WITH MATERIAL ELECTRICALLY TRANSFORMED INTO A VAPOR PHASE

Eduard Pinkhasov, Forest Hills, N.Y., assignor to Wedtech Corp., Bronx, N.Y.

Continuation-in-part of Ser. No. 494,302, May 13, 1983, , which is a continuation-in-part of Ser. No. 358,186, Mar. 15, 1982, Pat. No. 4,438,153, which is a continuation-in-part of Ser. No. 237,670, Feb. 24, 1981, Pat. No. 4,351,855. This application May 25, 1984, Ser. No. 614,434
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—37 **7 Claims**

1. A method of coating a quartz crucible for use in the melting of silicon which comprises the steps of:
juxtaposing a pair of electrodes, composed of at least one component of a material adapted to coat said crucible, with an interior surface of said crucible;
evacuating the space in which said electrodes are juxtaposed with said surface to a pressure of at most 10^{-5} torr and maintaining the pressure in said space substantially no higher than 10^{-5} torr during deposition; and
striking an electrical arc between said electrodes at one end of each of said electrodes at a voltage of substantially 30 to 60 volts and with a current of substantially 50 to 90 amperes by intermittently bringing said electrodes into contact with one another and separating them, thereby depositing material evaporated from said electrodes substantially uniformly over said interior surface of said crucible.

5. A method of coating a ceramic with a metal, comprising the steps of:



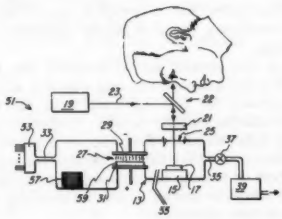
receiving a surface of a ceramic substrate by subjecting it to blasting with particles;
preheating said substrate to a temperature of at least 200° C. but less than the melting point of a metal to be applied thereto;
juxtaposing said surface of said substrarte with an electrode composed of said metal;
evacuating the space in which said electrode is juxtaposed with said substrate to at most 10^{-5} torr and maintaining the pressure in said space substantially no higher than 10^{-5} torr; and
striking an arc with said electrode by intermittently attacking same with another electrode while applying a voltage of substantially 30 to 60 volts across said electrode and passing a current of substantially 50 to 90 amperes through said electrodes to evaporate the electrode composed of said metal and deposit said metal on said surface.

4,505,949

THIN FILM DEPOSITION USING PLASMA-GENERATED SOURCE GAS

Edward C. Jelks, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 25, 1984, Ser. No. 603,545
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—38 **10 Claims**



1. A method for depositing a material on a surface of a substrate, comprising the steps of:
(a) supporting said substrate in a closed chamber,
(b) forming within said chamber a plasma between two

electrodes, at least one of said electrodes having a target surface containing said material,

(c) introducing a gas into said plasma, said gas characterized by the formation of volatile species of said material when said gas is introduced into a plasma between electrodes at least one of which has a target surface containing said material, and thereby generating said volatile species,

(d) transporting said volatile species from the vicinity of said target surface to the vicinity of said surface, and

(e) decomposing said volatile species in the immediate vicinity of said surface to deposit said material on said surface.

7. An apparatus for depositing a material on a surface of a substrate, comprising:

(a) a closed chamber;

(b) a support for said substrate in said chamber; and

(c) a pair of electrodes in said chamber, said electrodes characterized by the formation of a plasma between them when said electrodes are activated and at least one of said electrodes having a target surface containing said material.

4,505,950

METHOD OF MANUFACTURING A MULTIPLE-LAYER, NON-SINGLE-CRYSTALLINE SEMICONDUCTOR ON A SUBSTRATE

Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

Division of Ser. No. 377,314, May 12, 1982, , which is a division of Ser. No. 177,889, Aug. 14, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 429,257

Claims priority, application Japan, Aug. 16, 1979, 54-104452

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—38 **16 Claims**

1. A multi-layer, non-single-crystal semiconductor manufacturing method which employs a plurality of sequentially arranged reaction chambers separated from one another by normally closed shutter means, the reaction chambers being each provided with a gas inlet and a gas outlet, said method comprising the steps of:

positioning a first substrate in a first one of the reaction chambers;

depositing a first silicon compound including hydrogen or a halogen on the first substrate to form thereon a first non-single-crystal silicon layer of either one of N and P conductivity types by introducing a first gas mixture containing at least a gas of said first silicon compound and either one of N and P conductivity type impurity compound gases into the first reaction chamber through the gas inlet thereof in such a state that gas in the first reaction chamber is exhausted therefrom through the gas outlet thereof and by applying a first ionizing high-frequency electromagnetic field to the first gas mixture to ionize it into a first gas mixture plasma while at the same time passing the first gas mixture plasma into the first reaction chamber by discharging the gas in the first reaction chamber and maintaining the atmospheric pressure in the first reaction chamber below 1 atm and the temperature of the first substrate below 700° C. which is lower than that for single-crystallizing the first silicon deposited on the first substrate;

displacing the shutter means between the first reaction chamber and a second reaction chamber adjacent thereto and moving the first substrate from the first reaction chamber to the second reaction chamber and positioning a second substrate in the first reaction chamber while at the same time evacuating entirely the first and second reaction chambers or passing therethrough only carrier gases and then closing the shutter means between the first and second reaction chambers;

depositing a second silicon compound including hydrogen or a halogen on the first non-single-crystal silicon compound layer of the first substrate to form thereon a second non-single-crystal silicon compound layer of I conductivity type by introducing at least a gas of said second silicon compound into the second reaction chamber through the gas inlet thereof in such a state that gas in the second reaction chamber is exhausted therefrom through the gas outlet thereof and by applying a second ionizing high-frequency electromagnetic field to the second silicon gas to ionize it into a second gas plasma while at the same time passing the second gas plasma into the second reaction chamber by discharging the gas in the second reaction chamber and maintaining the atmospheric pressure in the second reaction chamber below 1 atm and the temperature of the first substrate below 700° C. which is lower than that for single-crystallizing the second silicon deposited on the first non-single-crystal silicon layer, and at the same time depositing the first silicon compound material on the second substrate to form thereon the first non-single-crystal silicon compound layer in the same manner as in the case of depositing the first non-single-crystal silicon layer on the first substrate;

displacing the shutter means between the second reaction chamber and a third reaction chamber adjacent thereto and the shutter means between the first and second reaction chamber and moving the first and second substrates from the second and first reaction chambers to the third and second reaction chambers, respectively, and positioning a third substrate in the first reaction chamber while at the same time evacuating entirely the first, second and third reaction chambers or passing therethrough only carrier gases and then closing the shutter means between the first and second reaction chambers and the shutter means between the second and third reaction chambers; and

depositing a third silicon compound including hydrogen or a halogen on the second non-single-crystal silicon compound layer of the first substrate to form thereon a third non-single-crystal silicon compound layer of the other one of N type and P type conductivity types by introducing a third gas mixture containing at least a gas of said third silicon compound and the other one of N and P type conductivity type impurity compound gases into the third reaction chamber through the gas inlet thereof in such a state that gas in the third reaction chamber is exhausted therefrom through the gas outlet thereof and by applying a third ionizing high-frequency electromagnetic field to the third gas mixture to ionize it into a third gas mixture plasma while at the same time passing the third mixture plasma into the third reaction chamber by discharging the gas in the third reaction chamber and maintaining the atmospheric pressure in the third reaction chamber below 1 atm and the temperature of the first substrate below 700° C. which is lower than that for single-crystallizing the second silicon deposited on the second non-single-crystal silicon layer, and at the same time depositing the first and second silicon on the third and second substrates to form thereon the first and second non-single-crystal silicon layers, respectively, in the same manner as in the case of depositing the first and second non-single-crystal silicon layers on the second and first substrates, respectively, whereby to fabricate multi-layer, non-single-crystal semiconductors having a PIN junction and in each step while a shutter is open between adjacent chambers, no plasma is energized in those chambers.

4,505,951

METHOD FOR MAKING A POLYVINYLIDENE CHLORIDE COATED BIAXIALLY ORIENTED POLYETHYLENE TEREPHTHALATE CONTAINER

Leo J. Kennedy, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 18, 1983, Ser. No. 516,065

Int. Cl.³ B05D *3/02, 3/06;* B32B *27/06, 27/36*

U.S. Cl. 427—55 **6 Claims**

1. A method of making a polyvinylidene chloride coated biaxially oriented polyethylene terephthalate container in

which the container has improved barrier properties, the method comprising the steps of: applying a liquid water-based emulsion of polyvinylidene chloride on the surface of the biaxially oriented polyethylene terephthalate container to form a coating, drying the coating with infra-red light energy to remove the water, and cooling the coating with air while drying the coating, the temperature of the cooling air about 40° F. to 60° F. and being sufficient to prevent undesirable shrinkage of the container while maximizing the removal of liquids without prematurely sealing the surface which would entrap unexpelled liquid.

4,505,952

METHOD FOR LUBRICATING AND CONDITIONING MONOFILAMENT FISHING LINES

Phillip W. Chambley, 20 Berkshire Dr., Rome, Ga. 30161

Filed Nov. 26, 1980, Ser. No. 210,828

Int. Cl.³ A01K *91/00;* **B05D** *5/08;* **B32B** *33/00*

U.S. Cl. 427—155 **6 Claims**

1. The new use of a synthetic yarn and fiber processing agent selected from the group consisting of lubricants and softening agents as used in the manufacture of nylon yarns and carpets, consisting of the steps of preparing an aqueous solution of said processing agent and applying said solution in drop form directly onto monofilament cast fishing line as contained on a filled reel spool.

4,505,953

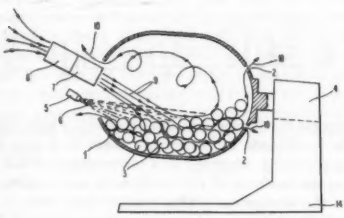
METHOD FOR PREPARING ENCAPSULATED PHASE CHANGE MATERIALS

Johnson C. H. Chen, and John L. Eichelberger, both of King of Prussia, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 466,802, Feb. 16, 1983, abandoned, which is a continuation-in-part of Ser. No. 145,228, Apr. 30, 1980, abandoned. This application Jun. 13, 1983, Ser. No. 504,029

Int. Cl.³ B05D *7/00;* **C09K** *3/18*

U.S. Cl. 427—212 **23 Claims**



1. A process for manufacturing a thermal energy storage phase-change composite product, comprising:

(a) selecting a thermal energy storage phase-change composition having a phase-change transition temperature within the temperature range of the contemplated environment in which the product is to be used, and maintaining the temperature of the composition below the melting point of the composition, after the composition has been first melted, to provide a solidified thermal energy phase-change composition;

(b) converting the solidified thermal energy storage phase-change composition of (a) to a flowable powder to provide a flowable powder composition while maintaining the composition at a temperature below its melting point;

(c) compacting and pelletizing the flowable powder composition of (b) to form discrete pellet-shaped compacted powder structures having a longest dimension of from about ¼ inch to about 1 inch and a shortest dimension of at least about ¼ inch while maintaining a temperature below the melting point of the composition, the degree of compacting being controlled to provide compacted powder structures of sufficient integrity to withstand coating with a wall-forming material as well as an apparent solid density that is less than or equal to the liquid density of the phase-change composition;

(d) coating each of the compacted powder compositions with a curable liquid wall-forming material comprising from about 5% to 30% by weight of the product based upon the final cured weight of the wall-forming material, while maintaining a temperature below the melting point of the composition, said wall-forming material when in a cured state being nonreactive with and substantially impermeable to both the phase-change composition and water; and then

(e) curing the liquid wall-forming material on each of the compacted powder compositions to form a permanent seamless shell, that is substantially impermeable to and non-reactive with both the phase-change composition and water, which encapsulates each of the compacted powder compositions to provide the product;

said product being capable of dispersion throughout rigid building construction components without causing fracture or damage to the components or product upon repeated thermal change cycles of the encapsulated thermal phase-change storage composition.

4,505,954

PROCESS FOR FORMING A CORROSION RESISTANT HIGH-BUILD TYPE COATING

Sadakazu Hokamura, Yamato; Toshio Shinohara; Ryoichi Nomura, both of Yokohama; Mitsutoshi Aritomi, and Yuji Yoshida, both of Ibaraki, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka and Mitsubishi Yuka Fine Chemicals Co., Ltd., Tokyo, both of, Japan

Filed Dec. 8, 1983, Ser. No. 559,371

Claims priority, application Japan, Dec. 28, 1982, 57-229953

Int. Cl.³ B05D *1/36, 2/00, 3/02*

U.S. Cl. 427—380 **7 Claims**

1. A process for forming a corrosion resistant high-build type coating film, which comprises (i) a step of priming on a substrate a coating composition comprising (a) 100 parts by weight of a mixture composed of from 99.9 to 60% by weight of a vegetable oil and/or a phthalic alkyd resin, and from 0.1 to 40% by weight of tricyclodecene and/or its derivative, and (b) from 1 to 500 parts by weight of at least one member selected from the group consisting of an oxyacid salt, and metal lead and its oxide and salt, followed by drying it to form a prime coat, and (ii) a step of applying thereon a radical-polymerizable and oxidation-polymerizable, room temperature curing type solventless coating composition, and polymerizing it to form a cured coating film.

4,505,955

MINERAL PARTICLES BOUND WITH SILICONE ELASTOMERIC EMULSION

Michael D. Meddaugh, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 30, 1981, Ser. No. 288,278

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—393 **14 Claims**

1. A uniform mixture consisting essentially of

(A) an aqueous silicone elastomeric emulsion comprising

(i) 100 parts by weight of an anionically stabilized, hydroxyl endblocked polydiorganosiloxane present as an oil-in-water emulsion,

(ii) from 1 to 150 parts by weight of colloidal silica having an average particle diameter of less than 0.5 micrometers,

(iii) from 0 to 200 parts by weight of filler other than colloidal silica, said filler having an average particle diameter of less than 10 micrometers, and

(iv) from 0.1 to 2.0 parts by weight of alkyl tin salt, said emulsion having a pH of 9 to 11.5, and

(B) mineral particles having an average particle diameter of greater than 150 micrometers, the ratio of (A) to (B) being such that upon the removal of the water, there is present 1 part by volume of silicone elastomer from (A) and from 3 to 40 parts by volume of (B).

6. A method of coating a substrate consisting essentially of (1) applying the mixture of claim 1 to the substrate, and (2) drying the applied mixture.

4,505,956

LUBRICANT FOR TREATING SYNTHETIC FIBERS

Hisao Yamamoto, and Osamu Kogiso, both of Gamagori, Japan, assignors to Takemotoyushi Co. Ltd., Aichiken, Japan

PCT No. PCT/JP82/00148, § 371 Date Dec. 27, 1982, § 102(e) Date Dec. 27, 1982, PCT Pub. No. WO82/03880, PCT Pub. Date Nov. 11, 1982

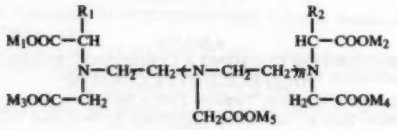
PCT Filed Apr. 30, 1982, Ser. No. 456,018

Claims priority, application Japan, Apr. 30, 1981, 56-65439

Int. Cl.³ D06M *13/20, 13/16, 13/40;* C09K *3/16*

U.S. Cl. 427—393.1 **4 Claims**

1. A method for improving the antistatic properties of synthetic fibers which comprises coating the fibers with a composition containing a compound having the formula



(I)

wherein:

R_1, R_2 is an alkyl group of 1 to 22 carbon atoms;

M_1–M_5 is one or more of the following members (1) to (6):

(1) a hydrogen atom or an alkali metal cation,

(2) a mono-, di- or tri(hydroxyalkyl) amine, the alkyl group having 2 to 4 carbon atoms,

(3) a mono-, di- or trialkyl amine, the alkyl group having 1 to 22 carbon atoms,

(4) a secondary or tertiary amine having a hydroxy-alkyl group wherein the alkyl group of 2–4 carbon atoms is bonded to the nitrogen atom,

(5) an addition product of ethylene oxide and a compound having an active hydrogen atom among the compounds of said (2), (3) and (4), the polymerization degree of ethylene oxide being 1 to 20, and

(6) a polyethylenepolyamine, the number of ethylene group being 1 to 5, and

n is 0, 1, 2, 3 or 4.

4,505,957

COATING BY ATOMIZATION OF HIGH (I.E., ABOUT 70–99% BY WEIGHT) SOLIDS FILM-FORMING COMPOSITIONS

Walter H. Cobbs, Jr., Amherst, and William R. Rehman, Vermilion, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 58,837, Jul. 19, 1979,. This application Dec. 13, 1982, Ser. No. 449,379

Int. Cl.³ B05D *1/02*

U.S. Cl. 427—422 **23 Claims**

11. A method of coating comprising

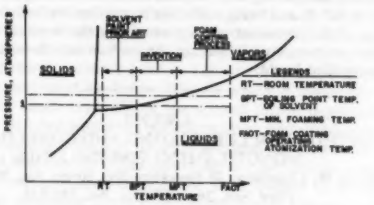
providing a coating composition comprising film-forming solids and a minor amount of a liquid atomizing agent, said composition containing about 70% to 99% by weight of said solids and about 1% to 30% by weight of said liquid atomizing agent,

coincidentally heating and mixing said composition in a loop maintained under a pressure for circulating said composition at a temperature above the normal boiling point of said liquid atomizing agent, said composition being maintained under pressure in its liquid state in said loop,

selectively dispensing said composition from the circulating loop,

atomizing said dispensed composition by reducing said pressure at a temperature above the normal boiling point of said liquid atomizing agent and below the minimum foaming temperature of said composition at atmospheric pressure, and

conveying the atomized composition to form a coating film of said solids on a surface.



4,505,958

METHOD FOR HOT DIP GALVANIZING METALLIC WORKPIECES

Hans-Wilhelm Lieber, and Roland Kammel, both of Berlin, Fed. Rep. of Germany, assignors to Hermann Huster GmbH & Co., Hagen, Fed. Rep. of Germany

Filed May 14, 1982, Ser. No. 378,473

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120401; Jan. 20, 1982, 3201475

Int. Cl.³ B05D *1/18*

U.S. Cl. 427—433 **21 Claims**

1. Process for fluxless hot dip galvanizing steel and ferrous metallic workpiece by immersing them in a zinc melt, the workpieces being subjected to a pretreatment which includes cleaning the surfaces of the workpieces and coating the surfaces of the workpieces with a reactive layer which assures a reaction with the zinc melt on the entire surfaces of the workpieces, and wherein the workpieces are immersed in the zinc melt with their surfaces in the dry state and are removed from said zinc melt after a predetermined period of time, comprising: applying a thin metal layer to the workpieces as the reactive layer and immersing the workpieces in the zinc metal, wherein said workpieces are immersed in the zinc melt after rinsing and drying, if necessary, but without a prior fluxing agent treatment and without chemical treatment between the application of the thin metal layer and immersing the workpieces in the zinc melt.

4,505,959

MULTI-FACETED FRAMED PICTURE

Norman Mable, P.O. Box 656, 10 Tremont St., Claremont, N.H. 03743

Filed Jan. 4, 1983, Ser. No. 455,507

Int. Cl.³ B44F *3/00*

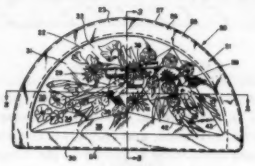
U.S. Cl. 428—14 **6 Claims**

1. In combination:

a frame having a front rim in a single flat plane;

a picture, or design, enclosed within said frame;

said picture being divided in its entirety into at least two, and no more than about twenty, interconnected, flat, planar sub areas, angularly disposed to each other and to said flat



planar front rim, adjacent said sub areas meeting along elongated angular ridges and elongated angular valleys;

said picture presenting a multi-faceted appearance being free of rounded surfaces and each sub area being of different peripheral outline and area from the other sub areas.

4,505,960

UNITARY SHOCK-ABSORBING POLYMERIC PAD FOR ARTIFICIAL TURF

James W. Leffingwell, Whitfield County, Ga., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 12, 1983, Ser. No. 522,872
Int. Cl.³ B32B *7/02*
U.S. Cl. 428—17 15 Claims

14. An artificial turf assembly comprising a layer of artificial turf bonded to a unitary, shock-absorbing, polymeric pad having a vertically asymmetric compression resistance, said pad having an upper layer exhibiting a 25 percent compression deflection at a load of less than 65 kilopascal and a lower layer exhibiting a 25 percent compression deflection at a load of at least 7 kilopascal higher than the load required for the 25 percent compression deflection of the upper layer; wherein said pad exhibits shock absorption such that the maximum value of G is from 30 to 200; wherein said upper layer comprises a polymer selected from the group consisting of polyvinyl chloride, a polyvinyl chloride-nitrile rubber and a reconstituted rubber; and wherein said lower layer comprises a polymer which is the same as the upper layer or polyethylene or polypropylene.

4,505,961

MICROWAVABLE HEAT AND GREASE RESISTANT CONTAINERS AND METHOD FOR THEIR PREPARATION

Pang-Chia Lu, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,556
Int. Cl.³ B32B *5/18, 7/00, 27/08*
U.S. Cl. 428—35 3 Claims

1. A multi-layer container adapted for microwave heating in the presence of hot fat comprising an interior layer and at least one thermoplastic exterior layer in contact with said interior layer, which exterior layer is not itself resistant to hot fat under microwave cooking conditions; said interior layer, which provides hot fat resistance, comprising a cellulose acetate propionate; said exterior layer being compatible with cellulose acetate propionate and containing recycled cellulose acetate propionate.

2. The multi-layer container of claim 1 in which said exterior layer comprises foamed polystyrene.

3. The multi-layer container of claim 1 in which said exterior layer comprises a foamed poly(para-methylstyrene) polymer or copolymer.

4,505,962

MICROWAVABLE PLASTIC CONTAINERS WITH HEAT AND GREASE RESISTANT LAYER COMPRISING IMPACT POLYMER

Pang-Chia Lu, Belle Mead, N.J., assignor to Mobil Oil Corporation New York, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,772
Int. Cl.³ B65D *11/02*
U.S. Cl. 428—35 7 Claims

1. A multi-layer container adapted for microwave heating in the presence of hot fat comprising an interior layer, of less than 5 mils in thickness and at least one thermoplastic exterior layer in contact with said interior layer, which exterior layer is not itself resistant to hot fat under microwave cooking conditions; said interior layer, which provides hot fat resistance, consisting of an impact polymer of styrene or para-methylstyrene and at least 5 weight percent rubber and free of polyolefin; said exterior layer comprising a polymer of styrene or para-methylstyrene, wherein said interior layer is substantially unoriented and has a thickness of 2 to 4 mils. and said impact copolymer comprises 5 to 14 weight percent rubber.

4,505,963

SEMI-METALLIC FRICTION PAD SUBJECTED TO RUST PREVENTIVE TREATMENT

Osao Ogiwara, Hanyu, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1983, Ser. No. 484,291
Claims priority, application Japan, Apr. 22, 1982, 57-66315
Int. Cl.³ B32B *15/08*
U.S. Cl. 428—74 3 Claims

1. A friction pad comprising a semi-metallic friction pad having a rust-preventive coating on each side thereof, said rust-preventive coating consisting essentially of a heat-proof binder and rust-proof metallic powder.

4,505,964

DEHESIVE LINING PAPER FOR WALL COVERINGS COMPRISING A FLEECE LAMINATED TO A FILM HAVING A LOW-ENERGY SURFACE

Wolfgang Dierichs, Dusseldorf; Werner Eberhardt, Leverkusen, and Jurgen Wegner, Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,276
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1982, 3233848
Int. Cl.³ B32B *33/00;* B44C *7/00;* E04F *13/20*
U.S. Cl. 428—85 21 Claims

1. A lining paper consisting essentially of a fleece to be attached to a substrate laminated on one side with a thin plastic film having a low energy surface to which wallpapers and wall coverings are to be attached and from which successive changes of wallpapers and wall coverings may be removed without destroying the lining paper or requiring the surface to be filled and smoothed before attachment.

16. A method of attaching wallpaper or a wall covering to a substrate comprising the steps of

A. first attaching to said substrate a lining paper comprising a fleece laminated on one side with a thin plastic film, wherein the fleece side is attached to the substrate; and

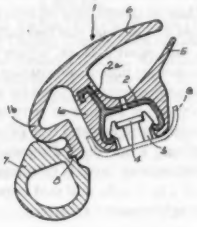
B. attaching wallpaper or wall covering to the plastic film side of said lining paper.

4,505,965

RAIN PROTECTIVE MOLDING FOR AUTOMOBILES

Wolfgang Zipperle, Favoritegarten 46, Ludwigsburg, Fed. Rep. of Germany

Filed Jun. 29, 1982, Ser. No. 393,375
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3137307
Int. Cl.³ B60R 9/04; E06B 7/14
U.S. Cl. 428—122 10 Claims



1. A rain molding strip for attachment to the rain gutter of a vehicle, comprising an elongated body molded of a polymer material, said elongated body being in a single piece over its entire length, said elongated body having at least one metal reinforcing strip embedded thereon, said reinforcing strip being disposed proximate said gutter of said vehicle, said elongated body having at least first and second cross-sectional profiles disposed at first and second portions of said elongated body, said first and second profiles being different in configuration, and said elongated body including at least one obliquely projecting lip which is integrally molded therewith to abut a portion of said rain gutter and said obliquely projecting lip extending over the length of said rain molding strip, said cross-sectional profile of said first portion of said elongated body being a U-shaped rain channel, one flank of said U-shaped channel being formed by said obliquely projecting lip, and elongated body including an arm forming the base of said U-shaped channel and a second tip extending from said arm and disposed generally parallel to said obliquely projecting lip forming the other flank of said U-shaped channel, said cross-sectional profile of said second portion of said elongated body being formed by the absence of a portion of said second lip.

4,505,966

MAGNETIC RECORDING MEDIUM

Tomio Adachi, Sagamihara; Shigeru Shiozaki, Machida, and Takashi Tomie, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 362,113, Mar. 26, 1982, abandoned. This application Jan. 16, 1984, Ser. No. 570,435
Claims priority, application Japan, Mar. 30, 1981, 56-45393; Mar. 31, 1981, 56-46348; May 8, 1981, 56-68105
Int. Cl.³ B05D 3/04
U.S. Cl. 428—141 4 Claims

1. A magnetic recording medium composed of an oriented polyethylene terephthalate film as a support layer and a thin magnetic metallic layer formed on one surface (A) of the support layer and optionally a lubricant layer formed on the other surface (B) of the support layer; characterized in that

(1) the surface A has a center-line average (CLA) of not more than 0.005 μm,

(2) the surface A has a peak-to-valley (PV) value of not more than 0.06 μm,

(3) the number of protrusions having a height of 0.27 to 0.54 μm on the surface A is at most 0.2 per mm^2, and

(4) the surface A is substantially free from protrusions having a height larger than 0.54 μm,

and wherein the oriented polyethylene terephthalate film support layer is produced by subjecting a lower alkyl ester of a dicarboxylic acid comprising terephthalic acid as a main component and a glycol comprising ethylene glycol as a main component to an ester-interchange reaction in the presence of, as a catalyst, a compound of at least one metal selected from Mn, Zn, Ca and Mg using a glycol solution of a trialkyl phosphate as a stabilizer wherein the concentration of phosphorus in the glycol solution is such that the amount of potassium hydroxide required to titrate the solution to a pH of 9.5 is expressed by the following formula:

$$0.53 \leqq \frac{(P)}{(KOH)} \leqq 0.71 \qquad (I)$$

wherein (P) is the amount (moles) of phosphorus in the glycol solution titrated, and (KOH) is the amount (moles) of potassium hydroxide required to the titration,

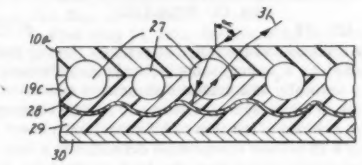
polycondensing the ester-interchange reaction product, extruding the resultant polyethylene terephthalate, stretching the resulting film, and heat-setting the stretched film.

4,505,967

HIGH-ANGULARITY RETROREFLECTIVE SHEETING AND METHOD FOR MANUFACTURE

Terry R. Bailey, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 11, 1983, Ser. No. 483,604
Int. Cl.³ G02B 5/128; B32B 3/00
U.S. Cl. 428—164 29 Claims



1. Retroreflective sheeting comprising first and second transparent polymeric layers; a monolayer of transparent microspheres embedded in the first layer to on the average less than half their diameter but more than one-tenth their diameter, with the extreme edges of the portions of the microspheres protruding from the first layer being aligned in a substantially common plane, and with the second transparent polymeric layer being laminated in substantially full contact to the microsphere-covered surface of the first layer, whereby it is in contact with the portions of the first layer between the microspheres; and a specularly reflective layer coated on the exposed configured surface of the second layer; said microspheres varying in diameter through a range equal to at least about 50 percent of the average diameter of the microspheres.

4,505,968

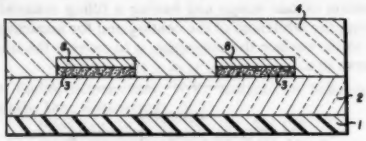
RESINOUS FLOORING SHEET

Taiji Ishii, Tokyo, and Takashi Tarutani, Sakado, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1982, Ser. No. 451,428
Claims priority, application Japan, Dec. 24, 1981, 56-212607
Int. Cl.³ B32B 3/00
U.S. Cl. 428—172 5 Claims

1. A resinous flooring sheet, which comprises: a transparent synthetic resin intermediate layer laminated on the surface of a light-shielding resinous base sheet, a light-shielding pattern formed by application of a light-shielding ink provided on the surface of said transparent synthetic resin intermediate layer, a non-light-shielding pattern formed by application of a non-

light-shielding ink provided on at least a part of the surface of said light-shielding pattern and a transparent synthetic resin



layer laminated on the entire outer surface including said transparent synthetic resin intermediate layer and said light-shielding and said non-light-shielding patterns.

4,505,969

ORIENTED POLYPROPYLENE WITH LINEAR LOW DENSITY POLY-ETHYLENE COPOLYMER COATING

Milton L. Weiner, Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 65,773, Aug. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 860,350, Dec. 14, 1977, abandoned. This application Feb. 9, 1982, Ser. No. 347,213

Int. Cl.³ B32B *27/08*

U.S. Cl. 428—213 **2 Claims**

1. An oriented laminar thermoplastic film comprising a base layer consisting essentially of polypropylene having at least one side thereof coated with an extruded layer consisting of a linear low density copolymer of ethylene and octene-1, siad copolymer having at least 90% by weight of ethylene and a density of from about 0.900 up to about 0.925, wherein said film is prepared by extrusion coating a layer of said copolymer onto at least one surface of a sheet of machine direction oriented polypropylene and then orienting the resultant multilayer sheet in the transverse direction.

4,505,970

MULTILAYER FILMS COMPRISING MIXTURES OF A MELT INDEX AND 2 MELT INDEX LINEAR LOW DENSITY POLYETHYLENE

Joseph N. Craver, Flossmoor, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1982, Ser. No. 428,993

Int. Cl.³ B32B *7/02*

U.S. Cl. 428—213 **13 Claims**

1. A multilayer film consisting essentially of a first outer layer of a blend of a low pressure, low density polyethylene having a melt index of about 1 decigram per minute and a low pressure, low density polyethylene having a melt index of about 2 decigrams per minute, said polyethylene having a melt index of about 1 decigram per minute being present in an amount of from about 40 to about 80 percent by weight of said first outer layer, said polyethylene having a melt index of about 2 decigrams per minute being present in an amount of from about 20 to about 60 percent by weight of said first outer layer, and a second layer comprising a high pressure, low density polyethylene containing up to about 30 percent by weight of a low pressure, low density polyethylene, based on the weight of said second outer layer.

4,505,971

FLUOROPLASTIC AND METAL LAMINATE HAVING RUBBER COMPOUND BONDED LAYERS

Theodore O. Martin, Jr., Wadsworth, Ohio, assignor to Ted Martin, Jr. and Chloeta Fay Martin, both of Wadsworth, Ohio

Filed Jun. 23, 1983, Ser. No. 507,048

Int. Cl.³ B32B *25/04, 25/14*

U.S. Cl. 428—216 **6 Claims**

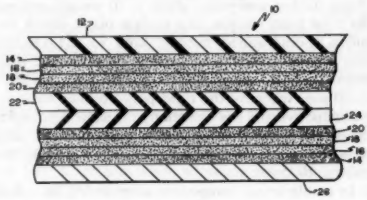
1. A laminate, comprising:

a substrate;

a metal primer layer positioned over said substrate, said metal primer layer containing chlorinated cis 1,4-polyisoprene having from about 60 to about 69 wt.% chlorine;

a ty ply layer positioned over said metal primer layer, said ty ply layer containing chlorinated cis 1,4-polyisoprene having from about 50 to about 69 wt.% chlorine;

a ty coat layer positioned over said ty ply layer, said ty coat layer containing about 100 parts by weight of cis 1,4 polyisoprene and about 40 to 60 phr of a chlorinated cis 1,4-polyisoprene having from about 12 to about 19 wt.% chlorine;



a rubber cement layer positioned over said ty coat layer, said rubber cement layer containing an elastomer made from monomers selected from the group consisting of dienes having from 4 to 12 carbon atoms, and combinations of dienes having from 4 to 12 carbon atoms and vinyl substituted aromatic compounds having from 8 to 20 carbon atoms; and

a rubber compound layer positioned over said rubber cement layer;

wherein said substrate is selected from the group consisting of a fluoroplastic or a metal.

4,505,972

CRACK PROPAGATION RESISTANT ACRYLIC SHEET

Thomas S. Moore, Maryville, and Delmas B. Pennington, Powell, both of Tenn., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 478,135, Mar. 23, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,246

Int. Cl.³ E06B *5/10;* **F41H** *5/26*

U.S. Cl. 428—220 **22 Claims**

1. A solid crack propagation resistant molded acrylic material comprising a copolymer prepared from about 76 to about 94 weight percent methyl methacrylate and from about 24 to about 6 weight percent of a lower alkyl methacrylate, said alkyl group containing from 2 to 4 carbon atoms, and when said lower alkyl methacrylate is ethyl methacrylate the copolymer is prepared from at least 12 weight percent ethyl methacrylate.

12. A method for improving the crack propagation resistance of a solid, molded polymethyl methacrylate article comprising copolymerizing from about 76 to about 94 weight percent methyl methacrylate with from about 24 to about 6 weight percent of a lower alkyl methacrylate, said alkyl group containing from 2 to 4 carbon atoms, and where said lower alkyl methacrylate is ethyl methacrylate the copolymer is formed from at least 12 weight percent ethyl methacrylate, and molding the copolymer into a solid.

4,505,973
ELECTRICALLY CONDUCTIVE RIGID POLYURETHANE FOAM

Thomas E. Neet, Grandview, Mo., and David A. Spieker, Olathe, Kans., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 8, 1983, Ser. No. 559,502
Int. Cl.³ B32B *3/26, 5/18;* **C08G** *18/14;* **H01B** *1/06*
U.S. Cl. 428—317.9 **13 Claims**

1. In a rigid, polyurethane foam, the improvement wherein the foam further comprises about 2–10 weight percent, based on the total foam weight, of a carbon black which has a ratio of nitrogen-determined surface area to CTAB-determined surface area of about 1.5–3 and a particle size distribution wherein at least 90 weight percent of the particles are of a size of 10–30 μm, whereby the rigid polyurethane foam is electrically conductive and has essentially the same mechanical properties as the same foam without carbon black added and wherein the rigid polyurethane foam has a density of greater than about 10 lb/ft^3.

12. In an electrical component surrounded by a rigid polyurethane foam, the improvement wherein said foam is the electrically conductive rigid polyurethane foam of claim 1.

4,505,974
DECORATIVE LAMINATE HAVING MAR-RESISTANT SURFACE

John F. Hosler, Cincinnati, Ohio, assignor to Formica Corporation, Wayne, N.J.

Filed Oct. 3, 1983, Ser. No. 538,626
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—329 **20 Claims**

1. A heat and pressure consolidated decorative laminate comprising, in superimposed relationship,

(a) a self-supporting substrate, and

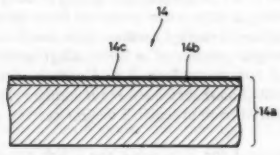
(b) a thermoset resin impregnated decorative sheet,

the outermost surface of said laminate containing mineral particles, said particles ranging in size from about 5 to about 100 millimicrons and being positioned within about the outermost 25 microns of said laminate thickness and in an amount ranging from about 0.5 to about 25 grams per square meter of laminate surface area.

4,505,975
THERMAL TRANSFER PRINTING METHOD AND PRINTING PAPER THEREFOR

Osamu Majima, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 21, 1982, Ser. No. 400,424
Claims priority, application Japan, Jul. 25, 1981, 56-109806[U]; Feb. 27, 1982, 57-29831
Int. Cl.³ G01D *15/34*
U.S. Cl. 428—336 **5 Claims**



1. A printing paper for receiving an image formed by the selective transfer thereto of disperse dye from a dye carrier of flexible sheet material in response to the selective application of thermal energy to the carrier while in contact with the printing paper; said printing paper consisting essentially of a base of cellulose fibers and a coating on a surface of said base formed of a resin having inter-molecular distances at least as large as the dimensions of molecules of said disperse dye and into which said disperse dye can diffuse for producing a clear definition of said image and having a filling material for improving the whiteness of the coating and for imparting roughness to the surface thereof which is to receive the transferred disperse dye.

4,505,976
STOMA SEAL ADHESIVE

Donald F. Doehnert, Millington, and Arthur S. Hill, Somerset, both of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Continuation-in-part of Ser. No. 244,194, Feb. 15, 1983, abandoned. This application Apr. 27, 1983, Ser. No. 486,961
Int. Cl.³ C08K *3/36;* **C08L** *5/04, 5/00;* **A61L** *15/00*
U.S. Cl. 428—355 **16 Claims**

1. A pressure-sensitive adhesive composition having a Williams Plasticity Number of from about 2 mm to 4 mm and the capacity to absorb at least about 7 percent of its own weight in water comprising:

(a) from about 30 to about 80 parts by weight of a pressure-sensitive adhesive component selected from the group consisting of natural rubber, silicone rubber, acrylonitrile rubber, polyurethane rubber, polyisobutylene, acrylic polymers and mixtures thereof,

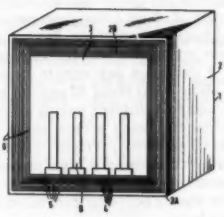
(b) from about 30 to about 80 parts by weight of a moisture absorbing component selected from the group consisting of karaya gum, locust bean gum, sodium acrylate polymers, polyvinylalcohol, powdered pectin, gelatin, carboxymethylcellulose, high molecular weight polyethylene glycol, and mixtures thereof; and

(c) from about 2 percent to about 20 percent by weight based on the total weight of said adhesive composition of silica.

4,505,977
THERMAL INSULATION

Dieter Hasenauer, Weinheim, and Harald Reiss, Leimen, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Mar. 24, 1983, Ser. No. 478,288
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211430
Int. Cl.³ H01M *6/36, 10/39*
U.S. Cl. 428—363 **3 Claims**



1. Thermal insulation to impede heat flow therethrough and capable of being stressed in compression without a steep increase in its thermal conductivity, which comprises, a double-walled housing having a single continuous evacuated space between the two walls of the housing through which said heat flows with a temperature gradient from one wall of the double-walled housing to the other wall of the double-walled housing, about 500 spaced layers formed from foils of mica paper are arranged parallel and one behind the other within and perpendicularly to the temperature gradient to impede the heat flow between the two housing walls, between each two successive layers of mica paper is disposed at least one intermediate layer of mica powder as a spacer and the layers of mica paper are wrapped around the outside surfaces of the inner boundary of

the housing, and the evacuated space containing the layers and the intermediate layers has a residual gas pressure of less than 0.1 mbar.

4,505,978

BONDABLE POLYAMIDE

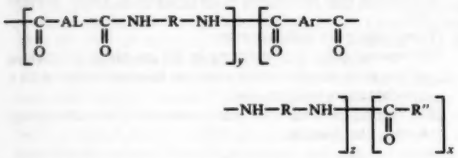
Scott D. Smith, Schenectady, N.Y., assignor to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed Sep. 28, 1982, Ser. No. 426,129

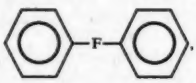
Int. Cl.³ B32B 15/00; C08G 18/83, 69/32; H01B 7/00

U.S. Cl. 428—379 **54 Claims**

1. A self bondable copolyamide having the formula



where AL is the divalent hydrocarbon residues of at least two unsubstituted aliphatic dicarboxylic acids having at least 6 carbon atoms, R is tolylene, phenylene,



where F is O, CH_2, or SO_2 or is a cycloaliphatic hydrocarbon, Ar is p-phenylene, y is 35 to 90% of the recurring units, z is 65 to 10% of the recurring units, R'' is the monovalent hydrocarbon radical of a hydrocarbon monocarboxylic acid having at least 3 carbon atoms and x represents 0.5 to 5% of the equivalents of carboxyl groups present.

4,505,979

PIN FOR CONNECTING MACHINE ELEMENTS WITH EACH OTHER

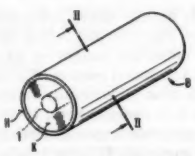
Christoph Rüegg, Basel, and Peter Voirol, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 479,343, Mar. 28, 1983, Pat. No. 4,456,653, which is a continuation of Ser. No. 259,393, Jun. 1, 1981, abandoned. This application Apr. 16, 1984, Ser. No. 600,868

Claims priority, application Switzerland, May 9, 1980, 3656/80; Dec. 23, 1980, 9519/80

Int. Cl.³ B32B 15/00; F16C 11/00

U.S. Cl. 428—379 **10 Claims**



1. A pin having a central longitudinal pin axis and being adapted for connecting machine elements with each other, which pin comprises a metal shell and a core therein, said core consisting essentially of fully hardened, oil-fast matrix system of a polyimide resin system having a glass transition temperature above 200° C. and at least about 55 percent by volume of the total core volume of a reinforcing granular fillter material embedded in said system.

4,505,980

INSULATED WIRE

Hiroshi Nishizawa, Kitaibaraki; Yoshiyuki Mukoyama, Hitachi; Shozo Kasai, Hitachi, and Yasunori Okada, Hitachi, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,199

Claims priority, application Japan, Oct. 8, 1982, 57-178168

Int. Cl.³ B32B 27/00; H01B 7/00

U.S. Cl. 428—383 **24 Claims**

1. An insulated wire obtained by coating on an electric conductor directly or via another insulating material a polyamide-imide resin composition prepared by a process comprising

reacting an aromatic diisocyanate and a tricarboxylic acid anhydride in approximately equimolar amounts in the presence of a basic solvent at a reaction temperature of about 160° C. or less while adjusting the resin content at 40% by weight or more,

adding to the reaction system a lactam in an amount of 0.1 to 1.0 mole per mole of the aromatic diisocyanate so as to mask terminal functional groups present in the reaction system and to make the reduced viscosity of the resin 0.1 to 0.27, and

baking the resin composition.

4,505,981

HEAT-HARDENABLE BINDER MIXTURE

Michael Geist, Münster, Fed. Rep. of Germany, assignor to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,528

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145714

Int. Cl.³ B32B 15/08, 17/06, 27/38, 27/40

U.S. Cl. 428—418 **14 Claims**

1. A process for preparing coatings by applying a coating composition to a substrate and subsequently hardening the resulting film by baking at temperatures of 130° to 200° C. for a period of 10 to 60 minutes to cross-link the film, wherein the coating composition contains a binder mixture of components comprising:

(A) 50 to 75% by weight of an organic resin having primary and/or secondary amino groups, a number average molecular weight of 500 to 20,000 and an amine equivalent weight of 150 to 7,500; and

(B) 5 to 50% by weight of a cross-linking agent based on an organic compound containing at least two carbalkoxymethyl ester groups, said organic compound selected from the group consisting of polyester resins and compounds containing free carboxyl groups to which said carbalkoxymethyl can be attached, the total amount of components A and B being 100%.

2. A coated substrate from a coating composition containing a binder mixture of components, comprising:

(A) 50 to 95% by weight of an organic resin having primary and/or secondary amino groups, a number average molecular weight of 500 to 20,000 and an amine equivalent weight of 150 to 7,500; and

(B) 5 to 50% by weight of a cross-linking agent based on an organic compound containing at least two carbalkoxymethyl ester groups, said organic compound selected from the group consisting of polyester resins and compounds containing free carboxyl groups to which said carbalkoxymethyl can be attached, the total amount of components A and B being 100%, said composition hardened to a resulting film by baking at temperatures of 130° to 200° C. for a period of 10 to 60 minutes to cross-link the film.

4,505,982

SHAPED BODY HAVING GOOD LONG-TERM THERMAL STABILITY AND CONTAINING FLUOROHYDROCARBON POLYMERS

Klaus Hoheisel, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,573

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045844

Int. Cl.³ B32B *27/00;* D02G *3/00*

U.S. Cl. 428—421 17 Claims

1. A shaped body exhibiting good long-term thermal stability and high mechanical strength, comprising:

at least one fluorohydrocarbon polymer which can be processed by melting; and

at least one heat-resistant thermoplastic polymer, wherein the shaped body comprises two phases which are non-homogeneous with one another and at least said fluorohydrocarbon polymer forms a phase which is at least essentially continuous.

4,505,983

HEAT-SENSITIVE TRANSFER SHEETS

Koji Kuroda, and Hideichiro Takeda, both of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1983, Ser. No. 493,947

Claims priority, application Japan, May 17, 1982, 57-82855

Int. Cl.³ B41M *5/26*

U.S. Cl. 428—423.1 4 Claims

1. A heat-sensitive transfer sheet comprising:

(a) a substrate; and

(b) a transfer layer formed on a surface of said substrate, said transfer layer containing a coloring agent and a binder, said binder melting upon heating;

wherein said binder comprises a compound having at least one —(NHCO)— group in each molecule, said binder compound comprising the reaction product of a compound selected from the group consisting of isocyanates, diisocyanates and triisocyanates and a compound having an active hydrogen atom, said binder compound having a melting point of from 50° C. to 200° C.

4,505,984

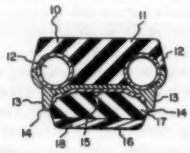
COMPOSITE RUBBER-URETHANE TANK TRACK PADS TO IMPROVE SERVICE LIFE

Gary J. Stelzer, Coldwater, and Calvin Harmon, III, St. Marys, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 12, 1984, Ser. No. 630,139

Int. Cl.³ B32B *15/06, 15/08, 27/08, 27/28*

U.S. Cl. 428—424.7 6 Claims



1. A track segment having a metallic base with a diene or olefin elastomer adhered thereto and a sole member of polyurethane adhered to said elastomer.

4,505,985

MEMBRANES BASED ON SILICIC ACID HETEROPOLYCONDENSATES AND A PROCESS FOR THEIR PRODUCTION

Helmut Schmidt, Höchberg; Alfred Kaiser, Kist, and Horst Scholze, Würzburg, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft, Munich, Fed. Rep. of Germany

Filed May 3, 1983, Ser. No. 491,173

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3217047

Int. Cl.³ B32B *9/04*

U.S. Cl. 428—447 24 Claims

1. A process for the production of membranes of silicic acid heteropolycondensates comprising:

(a) forming said membrane at the surface of a solid support by

(I) providing the solid support;

(II) impregnating or pretreating in the gas phase the surface of the support with water alone or in combination with a condensation catalyst; and

(III) feeding at least one silane selected from the group having the formula

$$SiR_a(R'Y)_bX_{(4a-b)}$$

wherein

R is alkyl, alkenyl, aryl, arylalkyl, alkylaryl, arylalkenyl or alkenylaryl;

R is alkylene, phenylene, alkylenephenylene or alkenylene, which can be further interrupted by oxygen or sulfur atoms or —NH— groups;

Y is halogen or a substituted amino, quaternary ammonium, amide, polyamide, aldehyde, keto, carboxyl, hydroxyl, polyol, mercapto, cyano, diazo, carboxylic acid alkyl ester, sulfonic acid, phosphoric acid, acryloyloxy, methacryloyloxy, epoxide or vinyl group;

X is hydrogen, halogen, hydroxyl, alkoxy, acyloxy or —NR''_2; wherein R'' is hydrogen and/or alkyl, with the proviso that not all X are hydrogen; and

a and b are 0–3, with the proviso that (a+b) are not greater than 3;

thereby obtaining the membrane by hydrolytic polycondensation.

4,505,986

PROCESS FOR COATING WOOD OR WOOD FIBRES-CONTAINING SUBSTRATES, AND AN OXIDATIVELY DRYING COATING COMPOSITION TO BE USED THEREWITH

Dirk J. F. Geerdes, Hoogerheide, and Klaus H. Zabel, Leidschendam, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Dec. 30, 1983, Ser. No. 566,985

Claims priority, application Netherlands, Dec. 30, 1982, 8205043

Int. Cl.³ B05D *3/02;* B32B *27/10*

U.S. Cl. 428—481 20 Claims

18. An oxidatively drying coating composition based on an alkyd resin as binder, characterized in that the alkyd resin has a number average molecular weight of 800–10000, an acid number of 0–80 and a hydroxyl number of 0–120 and is built up of 12–75% by weight of an ethylenically unsaturated monocarboxylic acid having 6–24 carbon atoms, 10–65% by weight of a saturated, di- or polyvalent cycloaliphatic carboxylic acid having 7–11 carbon atoms, 10–45% by weight of a di- or polyvalent hydroxyl compound and 0.1–8% by weight of a 2-(2'-hydroxyphenyl)-benzotriazole compound and/or a 2-hydroxybenzophenone compound having at least one substituent containing a carboxyl group, an aliphatic or cycloaliphatic hydroxyl group, a carboxyl group esterified with an alkyl group having 1–4 carbon atoms, an epoxy group and/or a primary or secondary amino group.

19. A process for coating a substrate with the aid of an oxidatively drying coating composition according to claim 18.

20. Coated substrate obtained by the process according to claim 19.

4,505,987
SLIDING MEMBER

Shinji Yamada, Fujisawa, and Saburo Hanafusa, Ohmiya, both of Japan, assignors to Oiles Industry Co., Ltd. and Mitsuya Seiko Co. Ltd., both of, Japan

Filed Nov. 10, 1981, Ser. No. 320,124
Int. Cl.³ B22F *7/04*; C22C *9/06*
U.S. Cl. 428—553 **5 Claims**

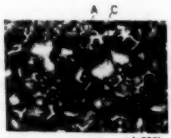
1. A multi-layered sliding member comprising a thin steel plate and a sintered metal layer secured on said thin steel plate, in which said sintered metal layer comprises 4 to 10 wt% of tin, 10 to 40 wt% of nickel, 0.5 to 4 wt% of phosphorus, 3 to 10 wt% of graphite and at least 36 wt% of copper.

3. A multi-layered sliding member, in which one multi-layered steel plate is formed by securing, on a thin steel plate, a sintered metal layer comprising 4 to 10 wt% of tin, 10 to 40 wt% of nickel, 0.5 to 4 wt% of phosphorus, 3 to 10 wt% of graphite and at least 36 wt% of copper, and said one multi-layered steel plate is integrally joined with a further steel plate by way of a thin copper alloy plate.

4,505,988
SINTERED ALLOY FOR VALVE SEAT

Shigeru Urano, Saitama; Kiyoshi Yamamoto, Chiba; Yoshiaki Takagi, and Takeshi Sugawara, both of Saitama, all of Japan, assignors to Honda Piston Ring Co., Ltd. and Honda Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jul. 28, 1983, Ser. No. 518,262
Claims priority, application Japan, Jul. 28, 1982, 57-131556
Int. Cl.³ B22F *3/26, 5/00*
U.S. Cl. 428—569 **4 Claims**



(x200)

1. A sintered alloy material for valve seats, in which hard grains are dispersed in a base structure and sintering cells are infiltrated with a copper alloy, which is characterized in that the sintered alloy comprises, as expressed in weight percent, 0.5 to 1.7% C, 0.5 to 2.5% Ni, 3.0 to 8.0% Cr, 0.1 to 0.9% Mo, 1.0 to 3.8% W, and 4.5 to 8.5% Co, the balance being substantially Fe provided by a base atomized powder, and contains 8 to 14% by volume of C—Cr—W—Co—Fe and Fe—Mo hard grains, both having a size of 250 mesh or less; the amount of cells formed using the atomized powder is 6 to 13% by volume, with an amount of closed cells of 0.4 to 1.2% by volume; and continuous ones of the cells are substantially infiltrated with the copper alloy.

4,505,989
PHOSPHOR AND RADIATION IMAGE STORAGE PANEL EMPLOYING THE SAME

Chiyuki Umemoto, and Kenji Takahashi, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Sep. 26, 1983, Ser. No. 535,928
Claims priority, application Japan, Sep. 27, 1982, 57-166696
Int. Cl.³ C09K *11/465*
U.S. Cl. 428—691 **4 Claims**

1. A divalent europium activated alkaline earth metal fluorohalide phosphor containing a transition metal as a coacitivator and a sodium halide, having the formula (I):

$$M^{II}FX.xNaX':yEu^{2+}:zA \quad (I)$$

in which M^{II} is at least one alkaline earth metal selected from the group consisting of Ba, Sr and Ca; each of X and X' is at least one halogen selected from the group consisting of Cl, Br I; A is at least one transition metal selected from the group consisting of V, Cr, Mn, Fe, Co and Ni; and x, y and z are numbers satisfying the conditions of $0<x\leqq 2$, $0<y\leqq 0.2$ and $0<z\leqq 10^{-2}$, respectively, and exhibiting a higher luminance and/or a lower erasing time than said phosphor absent A when it is exposed to x-rays and is subsequently stimulated with an electromagnetic wave within a wavelength region of 400–850 nm.

4,505,990
COATING COMPOSITIONS

Sunil P. Dasgupta, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

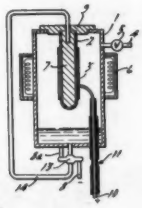
Filed Jul. 14, 1983, Ser. No. 513,877
Int. Cl.³ B32B *3/02*; B05D *5/12*; C04B *35/04*; C08L *1/08*
U.S. Cl. 428—694 **8 Claims**

1. A magnetic composition suitable for magnetic recording media, said composition consisting essentially of magnetic particles and from about 0.2 to about 10% based on the weight of the particles of an alkali or alkaline earth metal, ammonium or amine salt of a perfluoroalkyl sulfonic acid or carboxylic acid having the formula $CF_3(CF_2)_nSO_3H$ or $CF_3(CF_2)_nCOOH$ where n is 0 to 5.

4,505,991
SODIUM HEAT ENGINE ELECTRICAL FEEDTHROUGH

Neill Weber, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 25, 1984, Ser. No. 614,409
Int. Cl.³ H01M *6/36*
U.S. Cl. 429—11 **10 Claims**



1. A thermoelectric generator adapted to convert heat energy from a heat source to electrical energy, which comprises:

(1) means for enclosing a first reaction zone;

(2) means for enclosing a second reaction zone, said second reaction zone enclosure means comprising a wall, at least partially enclosing said second reaction zone;

(3) a reaction zone separator which

(a) separates and substantially completes enclosure of said first reaction zone and said second reaction zone, and

(b) comprises a cationically-conductive, solid electrolyte that is essentially impermeable to elemental alkali metal and compounds thereof and ionically conductive with respect to cations of said alkali metals;

(4) elemental alkali metal within said first reaction zone and in fluid communication with said solid electrolyte;

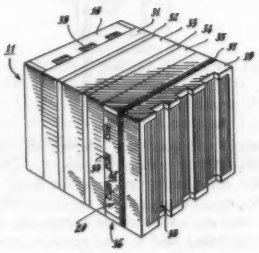
(5) an electrode within said second reaction zone in electrical contact with said solid electrolyte and sufficiently permeable to permit alkali metal vapor to pass therethrough;

(6) means for conducting electron flow between said elemental alkali metal within said first reaction zone and said electrode, which means comprises a conductor wire located between said electrode and a load external to said second reaction zone;
(7) inlet means for introducing said alkali metal into said first reaction zone;
(8) means for maintaining a temperature in said first reaction zone at least 100° C. in excess of the lowest temperature in said second reaction zone; and
(9) a hermetically sealed feedthrough structure for said conductor wire comprising:
(a) an electrically insulating ceramic tube disposed concentrically about said electrical conductor wire, said ceramic tube (i) extending through said wall, and (ii) having its end positioned in said second reaction zone sufficiently near the heat source so that at least said end of said ceramic tube is heated to be at a temperature sufficient to prevent condensation of said alkali metal thereon during operation of said generator;
(b) first and second metal tubes, not in electrical contact with each other, disposed about the exterior surface of said ceramic tube, said first metal tube (i) extending axially along the ceramic tube from a point outside said wall of said generator through said wall and forming a hermetic seal therewith, and (ii) being hermetically sealed to said ceramic tube at a point outside said generator, and said second metal tube being axially spaced from said first metal tube and extending axially along said ceramic tube exterior to said wall, one end of said second metal tube being located in proximity to the exterior end of said ceramic tube and the other end being hermetically sealed to said ceramic tube; and
(c) means for hermetically sealing said wire to said one end of said second metal tube.

4,505,992
INTEGRAL GAS SEAL FOR FUEL CELL GAS DISTRIBUTION ASSEMBLIES AND METHOD OF FABRICATION

Charles J. Dettling, E. Hanover, and Peter L. Terry, Chatham Township, Morris County, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Apr. 11, 1983, Ser. No. 484,014
Int. Cl.³ H01M 8/24
U.S. Cl. 429—36 10 Claims

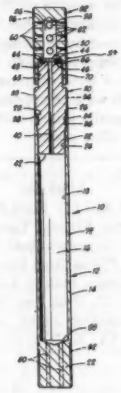


1. An assembly for distributing reactant materials in a fuel cell comprising two adjacent electrically conductive plate members forming an interface therebetween where they contact each other, at least a first of said plate members being made of a porous material suitable for distributing reactant material from a surface thereof other than its surface forming said interface with the other plate member, the two plate members being integrally bonded to one another at their interface with a sealant material residing in the pores of said first plate member in the region of said interface whereby the two plate members maintain electrical contact with one another while preventing the reactant material from passing from said first plate to said other plate through said interface.

4,505,993
BATTERY HOUSING

Neal G. Skinner, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed May 9, 1984, Ser. No. 609,064
Int. Cl.³ H01M 2/02
U.S. Cl. 429—100 20 Claims



1. A housing adapted to contain a battery therein, comprising:
receptacle means having a battery chamber therein and vent passage means associated therewith having an inlet and an outlet, said inlet opening on said battery chamber;
rupture disc means disposed across said outlet; and
diffuser head means over said rupture disc, said diffuser head means including a longitudinal bore therein having an open end and a blind end and at least one lateral passage intersecting said longitudinal bore and extending to the exterior of said housing, said open end of said bore being disposed adjacent said rupture disc means.

4,505,994
METAL-HALOGEN SECONDARY BATTERY

Masayoshi Shimada; Hideki Komagata, and Yasuhiro Iizuka, all of Ootsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 9, 1983, Ser. No. 521,594
Claims priority, application Japan, Aug. 9, 1982, 57-138699
Int. Cl.³ H01M 4/96, 10/36
U.S. Cl. 429—101 10 Claims

1. A metal-halogen secondary battery characterized by using a positive electrode produced so that, on the surface of the substantial material of the electrode, is joined a sheet-shaped article containing porous carbon fibers, of which the pore volume of the pores having a diameter in the range of from 30 to 1000 Å is more than 0.1 cc/g.

4,505,995

PLUGGING MICRO-LEAKS IN MULTI-COMPONENT, CERAMIC TUBESHEETS WITH MATERIAL LEACHED THEREFROM

Barrie H. Bieler, and Floris Y. Tsang, both of Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 19, 1981, Ser. No. 312,588
Int. Cl.³ H01M 4/36
U.S. Cl. 429—104 15 Claims

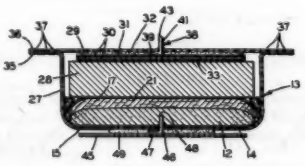
1. The process of plugging one or more microcracks in a multicomponent ceramic wall member which comprises selectively leaching the wall member with a solvent for one of said components and re-depositing the dissolved material in the crack or cracks by removal of said solvent from the resulting leach solution.

4,505,996

PRIMARY FLAT CELL

Robert D. Simonton, 1900 Hampton Rd., Fremont, Ohio 43420

Filed Oct. 7, 1983, Ser. No. 539,827
Int. Cl.³ H01M 6/46
U.S. Cl. 429—162 10 Claims



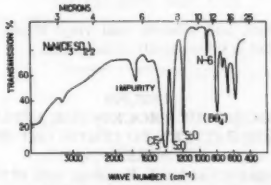
1. In a primary dry cell, a sealed flexible non-conductive plastic envelope, and an assembly of active cell elements within said envelope including a flexible pouch containing a fluid electrode mass, a first pouch wall including a flexible sheet of separator material which is absorbant to and retains liquid electrolyte on one side of said mass, a second pouch wall including a second flexible sheet of material which contains said mass on an opposite face of said mass from said first pouch wall, and a face-to-face bond between marginal portions of said first wall and said second wall and surrounding said fluid electrode mass.

4,505,997

BIS PERHALOGENOACYL -OR SULFONYL-IMIDES OF ALKALI METALS, THEIR SOLID SOLUTIONS WITH PLASTIC MATERIALS AND THEIR USE TO THE CONSTITUTION OF CONDUCTOR ELEMENTS FOR ELECTROCHEMICAL GENERATORS

Michel B. Armand, Nancy, France, and Fouzia El Kadiri Cherkaoui el Moursli, Sale, Morocco, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Paris and Societe Nationale Elf Aquitaine, Courbevoie, both of, France

Filed Jun. 1, 1983, Ser. No. 500,193
Claims priority, application France, Jun. 1, 1982, 82 09540
Int. Cl.³ H01M 6/18; H01G 4/14; C07C 119/06
U.S. Cl. 429—192 18 Claims



1. Ionic compound characterized by the formula:

$$(C_nX_{2n+1}Y)_2N^-, M^+$$

in which:

X is a halogen,

n varies from 1 to 4,

Y is a CO or SO_2 group and

M is a alkali metal.

7. Material with ionic conduction, constituted at least in part by a solid solution of one or several ionic compounds according to anyone of claims 1, 2, 3, 4, 5 or 6, entirely dissolved within a macromolecular material formed at least in part by a polymer whose monomer units include at least one heteroatom, adapted to form bonds of the donor-acceptor type with a cation of the ionic compound.

14. Electrochemical generator, wherein its electrolyte is constituted by the material according to claim 7 and the negative electrode associated with it is constituted by a material adapted to supply the alkali ion corresponding to the metal of the selected ionic compound, and the positive electrode which is associated with it is adapted to incorporate the atoms of this metal.

4,505,998

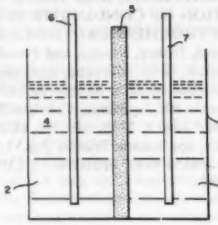
ALKALINE BATTERY CONTAINING A SEPARATOR OF A CROSS-LINKED COPOLYMER OF VINYL ALCOHOL AND UNSATURATED CARBOXYLIC ACID

Li-Chen Hsu, Westlake; Warren H. Philipp, N. Olmsted; Dean W. Sheibley, Sandusky, and Olga D. Gonzalez-Sanabria, N. Olmsted, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 10, 1981, Ser. No. 282,298
Int. Cl.³ H01M 6/04
U.S. Cl. 429—206 1 Claim

1. In an alkaline battery comprising an alkaline electrolyte, a positive electrode, a negative electrode, and a separator interposed between said electrodes and permeated by said electrolyte but substantially impermeable to gaseous oxygen, the improvement wherein said separator comprises a cross-linked copolymer comprising from 1 to 99 mole % vinyl alcohol units and from 99 to 1 mole % carboxylic acid units and wherein said crosslinked copolymer is formed by reacting a vinyl ester and an unsaturated carboxylic acid, or ester or anhydride

thereof to form a vinyl ester-carboxylic acid or ester copolymer, followed by hydrolysis to form a vinyl alcohol-carboxylic



acid copolymer, and wherein said vinyl alcohol-carboxylic acid copolymer is subsequently cross-linked.

4,505,999

PHOTOGRAPHIC PROCESS FOR APPLYING PHOSPHOR PATTERN TO COLOR CRT SHADOW MASK

Robert L. Bergamo; Gordon T. Foreman, both of Seneca Falls; Anthony V. Gallaro, Auburn, and Judy A. Nagel, Romulus, all of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Sep. 12, 1983, Ser. No. 531,140
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—24 **8 Claims**

1. A photographic process for providing a phosphor pattern on one side of a color cathode ray tube shadow mask, the tube comprising in addition to the mask; an electron gun, a viewing panel opposite the gun, a phosphor screen on the interior surface of the panel; said mask being metal and bearing a protective oxide coating, and defining an array of apertures for directing electron beams from the gun to desired phosphor elements on the screen when the mask is positioned within the viewing panel spaced from the screen; said apertures being smaller in size relative to the phosphor pattern on the mask, whereby the phosphor pattern bridges individual apertures; said process comprising the steps of:

(a) applying a uniform layer of a positive-working photoresist composition to the shadow mask surface, at least in the areas where phosphor is desired;

(b) applying a uniform layer of phosphor particles in contact with the photoresist layer;

(c) exposing the photoresist layer to actinic radiation through a positive photomask to solubilize the exposed portions of the photoresist layer;

(d) exposing the reverse side of the shadow mask to actinic radiation to solubilize portions of the photoresist layer in the areas of the shadow mask apertures;

(e) contacting the photoresist layer with a solvent to remove the solubilized portions of the layer; and

(f) baking the shadow mask to remove the remaining photoresist, leaving a uniform, adherent layer of phosphor pattern on the mask.

4,506,000

MAGNETIC RECORDING MEDIUM

Isao Kubota, Tagajyo; Kunio Kobayashi, Izumi, and Toshimi Miyao, Shiogama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,356
Claims priority, application Japan, Jul. 21, 1981, 56/113900
Int. Cl.³ G11B *5/70*; H01F *10/02*
U.S. Cl. 430—39 **3 Claims**

1. A magnetic recording medium, comprising:

(a) a non-magnetic substrate;

(b) a first magnetic layer composed mainly of magnetic powder and binder and formed on said non-magnetic substrate; and

(c) a second magnetic layer composed mainly of magnetic powder and binder and formed on said first magnetic layer, the magnetic powder of said first magnetic layer being made of ferro-magnetic metal powder which has a specific surface area of 20 to 40 m^2/g measured by BET adsorption method, said first magnetic layer having coercive force H_{c1} of 800 to 1500 Oe, residual magnetic flux density of 3000 to 5000 Gausses and a thickness of more than 2μ, the magnetic powder of said second magnetic layer being made of ferro-magnetic metal powder which has a specific surface area of 40 to 150 m^2/g measured by the BET adsorption method, said second magnetic layer having coercive force H_{c2} of 1000 to 2500 Oe, residual magnetic flux density of 2000 to 3000 Gausses and a thickness 0.1 to 2μ, and said coercive forces H_{c1} and H_{c2} being selected to satisfy $H_{c1} \leqq H_{c2}$, said medium as a result of the aforementioned specific surface areas having a lower bias noise than exists when only a single magnetic layer is present.

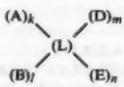
4,506,001

PHOTOGRAPHIC RECORDING MATERIAL CONTAINING NOVEL COORDINATION POLYMER

Shinji Sakaguchi; Hisashi Okamura, and Shigeru Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

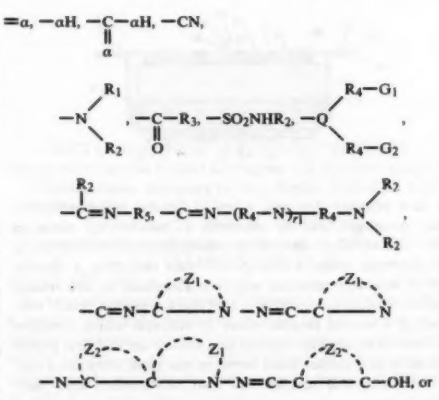
Continuation of Ser. No. 379,697, May 19, 1982, abandoned.
This application Apr. 3, 1984, Ser. No. 595,632
Claims priority, application Japan, May 19, 1981, 56/75269
Int. Cl.³ G03C *1/40, 5/54*
U.S. Cl. 430—213 **16 Claims**

1. A photographic recording material comprising a support having thereon at least a mordant layer, said mordant layer or a layer superposed on said support and in close proximity to the mordant layer containing a coordinate polymer composed of a ligand represented by the following general formula (I) and a metal ion;



(I)

wherein A, B, D and E, which may be the same or different, each represents a coordinating group selected from the group consisting of:



-continued

$H^{\oplus}$

wherein α represents O or S, R_1 represents R_2 or —CONH—R_2, —SO_2R_6 or —SO_2NHR_6, R_2 represents a hydrogen atom or an alkyl group containing 1 to 6 carbon atoms, R_3 represents R_2 or —CH_2COR_5, R_4 represents an alkylene group containing 1 to 4 carbon atoms, R_5 represents —OH or R_6, R_6 represents an alkyl group containing 1 to 6 carbon atoms or an aryl group containing 6 to 10 carbon atoms, Q represents N, P or As, G_1 and G_2 each represents

—C(=α)-H, —CN, —$P(OH)_2$, —P(=O)—OH or —C(=O)—NHOH,

r_1 represents an integer of 0 to 4, Z_1 represents atoms necessary for forming at least one 5- to 7-membered hetero ring, and Z_2 represents Z_1 or atoms necessary for forming at least one 5- to 7-membered carbon ring, L represents phenyl, naphthalene, biphenyl, —CH_2Z_4—CH_2—, or —$(CH_2)_{r_4}Z_4$—Y_2—Z_4—$(CH_2)_{r_4}$, wherein Z_4 represents phenylene or naphthalene, Y_2 represents —O—, —CONH—, —SO_2NH—, —CO— or —SO_2—, and r_4 represents 0 or 1 and having a valency of (k+l+m+n), and k, l, m and n each represents an integer of 0 to 6, with k+l+m+n being 2 to 10.

4,506,002

DIFFUSION TRANSFER PHOTOGRAPHIC ELEMENTS WITH POLYMER GRAFTED PIGMENT

Hideki Takaki; Hiroshi Hayashi; Shigetoshi Ono, and Hisashi Okamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 28, 1983, Ser. No. 555,733

Claims priority, application Japan, Nov. 26, 1982, 57-207343

Int. Cl.³ G03C *5/54, 1/40, 1/84*

U.S. Cl. 430—215 **27 Claims**

1. A diffusion transfer photographic element, comprising:

a support having thereon at least one of a photosensitive silver halide emulsion layer and an image-receiving layer;

said photosensitive element containing a polymer compound obtained by graft polymerizing a monomer compound to a pigment;

wherein the pigment is carbon black.

4,506,003

POSITIVE-WORKING RADIATION-SENSITIVE MIXTURE

Hans Ruckert, Wiesbaden; Gerhard Buhr, Königstein, and Hartmut Steppan, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 274,402, Jun. 17, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 551,025

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023201

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—270 **13 Claims**

1. A positive-working radiation-sensitive mixture, comprising:

a compound having at least one C—O—C bond which can be split by acid, said compound being selected from an orthocarboxylic acid derivative and a polyacetal;

a compound which forms a strong acid when radiated;

from 20 to 90% by weight, relative to the non-volatile constituents of the mixture, of a binder which is insoluble in water and soluble in an aqueous-alkaline solution;

and

from 1 to 50% by weight, relative to the non-volatile constituents of the mixture, of at least two resinous materials having solubility properties which differ from those of said binder, said resinous materials comprising a polyvinyl alkyl ether and an alkyl acrylate or methacrylate polymer, or a copolymer thereof.

4,506,004

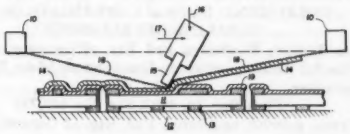
PRINTED WIRING BOARD

Donald F. Sullivan, 115 Cambridge Rd., King of Prussia, Pa. 19406

Filed Apr. 1, 1982, Ser. No. 364,309

Int. Cl.³ G03C *5/00, 5/06*

U.S. Cl. 430—312 **9 Claims**



1. The process for producing a solder mask coating on a printed wiring board having electrical conductors disposed on an insulating surface in a pattern leaving exposed only predetermined areas of printed wiring to which solder will adhere, comprising the steps of,

coating over the printed wiring board rough contour surface configuration with a layer of a circuit trace pattern extending from the insulating surface a layer of liquid polymer adhesive of predetermined thickness overlying the electrical conductors and insulating surface free from air pockets between the layer and the rough contour board surface,

depositing a layer of solder mask polymer of predetermined thickness on a carrier surface

transferring said solder mask polymer layer as an outer surface layer onto the printed wiring board surface coated with liquid photopolymer in the liquid phase ambient temperature and pressure thereby to conform with the wiring board surface configuration and forming thereby on the surface of the board two laminated layers of polymer of differing characteristics,

exposing both said layers to a radiation source through a pattern for hardening the polymer layers in selected positions to form said solder mask and said predetermined unexposed areas to which solder will adhere,

washing out the unhardened polymer layers, and curing the remaining composite coating to form the solder mask coating.

4,506,005

METHOD OF CATALYTIC ETCHING

Steven A. Lis, Needham, Mass., assignor to GCA Corporation, Bedford, Mass.

Filed May 10, 1983, Ser. No. 493,151

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—317 **6 Claims**

1. In the production of semiconductor elements, a method of etching a chalcogenide layer on a semiconductor substrate comprising

providing a chalcogenide layer on a semiconductor substrate;

over said chalcogenide layer, providing a layer including a metal which catalyzes oxidizing reactions of said chalcogenide;

exposing said coated substrate to radiant energy in a desired

pattern thereby to drive some of said metal into said chalcogenide in correspondence with said pattern;

removing the overlying metal including layer, leaving the metal embedded in said chalcogenide;

generating a plasma of a gas reactive with said chalcogenide in an oxidizing reaction catalyzed by said catalyst to consume said chalcogenide, and

directing said plasma to the surface of said chalcogenide, whereby said plasma reacts with said chalcogenide preferentially in the areas of said imbedded catalyst metal to selectively etch the chalcogenide in said areas to form a positive resist pattern over said semiconductor substrate.

4,506,006

PROCESS FOR PREPARING RELIEF IMAGES IN IMAGED IRRADIATED LIGHT-SENSITIVE MATERIAL HAVING ACID-CLEAVABLE COMPOUND BY HOT AIR TREATMENT, OVERALL IRRADIATION AND ALKALINE DEVELOPMENT

Hans Ruckert, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,739

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3151078

Int. Cl.³ G03C *7/26, 7/00*

U.S. Cl. 430—325 **10 Claims**

1. A process for preparing relief images, comprising the steps of:

imagewise irradiating a light-sensitive material comprised of a support and a light-sensitive layer which consists essentially of

(a) a compound which has at least one C—O—C bond which is cleavable by acid;

(b) a compound which forms a strong acid on irradiation, and

(c) a binder which is insoluble in water and soluble in aqueous-alkaline solutions to produce imaged and non-imaged areas;

warming the irradiated material in heated air to an elevated temperature sufficient to render the imaged areas resistant to developing;

bringing the material to a lower temperature;

uniformly irradiating the entire area of the layer; and

selectively developing the non-imaged areas from the imagewise irradiating step.

8. A process for preparing relief images, comprising the steps of:

imagewise irradiating, according to a first pattern, a light-sensitive material comprised of a support and a light-sensitive layer which consists essentially of

(a) a compound which has at least one C—O—C bond which is cleavable by acid,

(b) a compound which forms a strong acid on irradiation, and

(c) a binder which is soluble in water and soluble in aqueous-alkaline solutions, developing the irradiated layer to produce bared areas in the regions of irradiation;

modifying said bared areas to provide a metal surface;

before or after said modification, imagewise irradiating the remaining areas of the layer according to a second pattern;

warming the irradiated material in heated air to an elevated temperature sufficient to render the imaged areas resistant to developing;

bringing the material to a lower temperature;

uniformly irradiating said remaining layer areas; and

after said modification, developing said remaining layer areas to remove the non-irradiated areas of said second imagewise irradiation.

4,506,007

METHOD FOR PROCESSING COLOR PHOTOGRAPHIC MATERIALS

Junya Nakajima; Isamu Itoh; Kiyohiko Yamamuro, and Eiiti Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

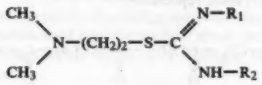
Filed Apr. 9, 1984, Ser. No. 598,104

Claims priority, application Japan, Apr. 8, 1983, 58-61708

Int. Cl.³ G03C *7/00*

U.S. Cl. 430—393 **9 Claims**

1. A method for processing an exposed silver halide color photographic material by development and desilvering, which comprises the steps of (1) treating said material in a color developing bath, (2) treating the developed material in a bath having incorporated therein at least one compound of formula (I) or a salt thereof:



(I)

wherein R_1 and R_2 each represent a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, provided that at least one of R_1 and R_2 is an alkyl group and R_1 and R_2 may be the same or different, and (3) treating said material in a bath having bleaching or bleach-fixing ability.

4,506,008

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Tadao Sugimoto, and Hideo Ikeda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 9, 1983, Ser. No. 502,808

Claims priority, application Japan, Jun. 9, 1982, 57-98927

Int. Cl.³ G03C *1/76*

U.S. Cl. 430—502 **7 Claims**

1. A silver halide photographic light-sensitive material, comprising:

a support base having positioned thereon:

a silver halide emulsion layer; and

a protective layer;

the silver halide emulsion layer being comprised of an upper layer and lower layer, the upper layer comprising a photosensitive silver halide emulsion, the lower layer comprising a photosensitive silver halide emulsion and an inside fogged silver halide emulsion, and the particle size of the inside fogged silver halide is smaller than that of the particle size of the photosensitive silver halide in the upper layer and the lower layer wherein the photosensitive silver halide emulsion in the upper layer and the lower layer contains silver iodide in an amount within the range of 0.1 to 30% by mol.

4,506,009

HETEROGENEOUS IMMUNOASSAY METHOD

Howard M. Lenhoff, Costa Mesa, and That T. Ngo, Irvine, both of Calif., assignors to University of California, Berkeley, Calif.

Filed Mar. 30, 1982, Ser. No. 363,481

Int. Cl.³ G01N *33/54;* C12N *9/96*

U.S. Cl. 435—7 **14 Claims**

1. A heterogeneous immunoassay method for determining the amount of a component to be analyzed, said component to be analyzed being a component in the reaction of two immunobinding partners, one of said immaunobinding partners being an antigen and one of said immunobinding partners being an associated antibody, said component to be analyzed being dissolved in a liquid sample, which comprises:

providing a liquid sample containing a reaction mixture dissolved therein, said reaction mixture consisting essen-

tially of (a) an undetermined amount of said component to be analyzed, (b) a conjugate of (i) a marker, (ii) an immunoreactive component bound to said marker and having the same immunochemical properties of said component to be analyzed and (iii) an insolubilizing binding component bound to said marker and which contains a group reactive with an insolubilizing receptor to react with said insolubilizing receptor to form a solid phase in said liquid sample, said insolubilizing receptor and said insolubilizing binding component having a binding constant of at least about 10^9 molar, the reactivity of said group of said insolubilizing binding component for said insolubilizing receptor being deactivated when said immunobinding partner immunoreacts with said immunoreactive component of said conjugate, and (c) a predetermined amount of said immunobinding partner of the component to be analyzed, said predetermined amount being such that there is a certain amount of unreacted conjugate remaining in said liquid sample;

allowing said liquid sample to incubate until the reaction is complete between said immunobinding partner and said component to be analyzed and said immunobinding partner and said conjugate, the reaction product of said immunobinding partner and said conjugate being soluble in said liquid sample;

contacting said liquid sample after said reaction is complete with a stoichiometric excess, based on the amount of unreacted conjugate in said liquid sample of said insolubilizing receptor and allowing the reaction between said insolubilizing receptor and said unreacted conjugate to go to completion and form a solid precipitate;

separating said solid phase from said liquid sample; and

determining the quantity of said component to be analyzed by measuring the activity of the marker in either the solid phase or the liquid sample.

4,506,010

METHOD FOR TESTING MICROBIAL DEGRADATION OF CELLULOSE

Nelson Goodman, and Brian C. Cunningham, El Cerrito, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 237,004, Feb. 23, 1981, abandoned. This application Dec. 14, 1981, Ser. No. 330,640

Int. Cl.³ C12Q *1/18, 1/06, 1/04;* **C12P** *19/14*

U.S. Cl. 435—32 **2 Claims**

1. A method for measuring pesticidal effect on growth and function of cellulase-producing microorganisms which comprises

(a) forming a mixture of water and a water-soluble colloidal cellulose derivative which is enzyme depolymerxable as a growth medium;

(b) providing suitable nutrients to the medium to familitate microorganism growth;

(c) inoculating the medium with a cellulase-producing microorganism;

(d) treating separate portions of the medium with the pesticide to be tested while retaining at least one separate portion as a comparison test control;

(e) measuring changes in optical density; and

(f) measuring changes in the viscosity of the medium over a period of time whereby the inhibitory effects of the pesticide can be measured by observed changes in optical density and viscosity of the cellulose sulfate/water mixture portions when compared to the test control.

4,506,011

PROCESS FOR PREPARATION OF ASPARTYLPHENYLALANINE ALKYL ESTERS

Tsuneo Harada, Tokuyama; Hisao Takemoto, Nanyo, and Tatsuo Igarashi, Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Nanyo, Japan

Filed Aug. 26, 1982, Ser. No. 411,628

Claims priority, application Japan, Sep. 5, 1981, 56-139247; Oct. 14, 1981, 56-162697; Jan. 18, 1982, 57-4830

Int. Cl.³ C12P *21/02;* **C12R** *1/05, 1/40, 1/645, 1/88*

U.S. Cl. 435—70 **10 Claims**

1. A process for preparing an aspartylphenylalanine alkyl ester, which comprises:

(1) contacting a liquid culture, cells or a lytic product of cells of a microorganism selected from the group consisting of *Pseudomonas putida* (FERM BP 159), *Alcaligenes faecalis* (FERM BP 160), *Torulopsis candida* (FERM BP 161), *Rhodotorula glutinis* (FERM BP 162) and *Sporobolomyces odorus* (FERM BP 163), said microorganism being capable of producing α-L-aspartyl-L-phenylalanine lower alkyl ester from L-aspartic acid and a lower alkyl ester of L-phenylalanine, with L-aspartic acid and a lower alkyl ester of L-phenylalanine in an aqueous medium at a pH from about 4 to about 7; and

(2) recovering the aspartylphenylalanine alkyl ester so produced.

4,506,012

PRODUCTION OF ORGANIC ACIDS BY A CONTINUOUS FERMENTATION PROCESS

William M. Reed, Bloomingdale, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Mar. 11, 1983, Ser. No. 474,412

Int. Cl.³ C12P *7/56, 7/40;* **C12N** *11/14*

U.S. Cl. 435—139 **12 Claims**

1. A process for the continuous production of an organic acid by a homoacidogenic fermentation reaction characterized in that the acid is produced by fermenting a carbohydrate solution by passing the solution over cells of a homoacidogenic microorganism growing on the surface of a support material selected from the group consisting of activated carbon or corn cob granules under conditions of pH, temperature and dilution rate effective to produce the acid at a volumetric productivity of at least about 5 g/1-hr.

4,506,013

STABILIZING AND SELECTING RECOMBINANT DNA HOST CELLS

Charles L. Hershberger, New Palestine; Anna K. Radue, Martinsville, and Paul R. Rosteck, Jr., Beech Grove, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 193,556, Oct. 3, 1980, abandoned. This application Jun. 18, 1981, Ser. No. 275,088

Int. Cl.³ C12N *15/00, 1/20, 1/06, 1/00;* **C12P** *21/00, 21/02, 19/34;* **C12R** *1/19*

U.S. Cl. 435—172.3 **134 Claims**

1. A method for stabilizing and selecting bacterial host cells containing recombinant DNA which expresses a functional polypeptide comprising:

(a) transforming the bacterial host cells with a recominant DNA cloning vector which contains both a repressor gene and a gene which expresses a functional polypeptide; and

(b) lysogenizing the transformed bacterial host cells with a bacteriophage lysogenic organism containing a marker which is lethal in the bacterial host cells but which is repressed in the transformed bacterial host cells by the repressor gene contained in the recombinant DNA cloning vector;

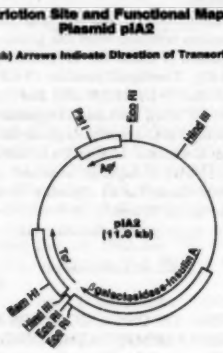
subject to the limitation that the recombinant DNA cloning vector contains a replicon and a promoter which are not sensitive to the repressor, and subject to the further limitation, that

when the bacterial host cells are lysogenized with a bacteriophage lysogenic organism containing a gene which is conditionally lethal, the resulting bacterial host cells are cultured under restrictive conditions.

28. A transformed bacterial host cell comprising:

(a) a recombinant DNA cloning vector containing both a repressor gene and a gene which expresses a functional polypeptide; and

(b) a chromosomal marker which is lethal or conditionally lethal but which is repressed by the repressor gene contained in the recombinant DNA cloning vector;



subject to the limitation that the recombinant DNA cloning vector contains a replicon and a promoter which are not sensitive to the repressor.

4,506,014

PLASMID PAC 1, A PROCESS FOR OBTAINING IT AND ITS USE

Karl Esser, Bochum, and Walter Minuth, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 19, 1982, Ser. No. 435,243

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1981, 3141691

Int. Cl.³ C12N *15/00, 1/00;* **C12P** *35/06*

U.S. Cl. 435—172.3 **4 Claims**

1. A plasmid, pAC 1, isolated from *Acremonium chrysogenum* ATCC 14553 and having a contour length of about 6.7 microns and a molecular size of about 20.9 kilobases, which plasmid is divided into six fragments having the sizes 5.10, 4.75, 4.30, 3.50, 2.15 and 1.05 kilobases by the restriction endonuclease Bgl II, is divided into five fragments having the sizes 8.1, 4.7, 4.4, 2.6 and 1.3 kilobases by the restriction endonuclease Eco R I, and is divided into nine fragments having the sizes 5.61, 4.30, 3.50, 2.72, 1.35, 1.25, 0.82, 0.74, and 0.61 kilobases by the restriction endonuclease Hpa I.

4,506,015

MULTI-LAYER IMMOBILIZED ENZYME COMPOSITIONS

Guan-Huei Ho, and Chiang-Chang Liao, both of Tillsonburg, Canada, assignors to Borden Company Limited, Ontario, Canada

Continuation of Ser. No. 148,012, May 8, 1980, abandoned. This application Oct. 19, 1982, Ser. No. 435,218

Int. Cl.³ C12N *11/18, 11/14, 9/38, 9/92*

U.S. Cl. 435—175 **20 Claims**

1. An enzymatically reactive composite having a high surface area per unit volume and having plural sequentially applied amounts of enzyme which comprises an activated silica gel having chemically reactive groups at its surface, said activated silica gel prepared by treating silica gel first with a strong base and then treating the resulting material with a strong acid, a first amount of an enzyme immobilized to said composite by a chemical coupling means comprising an aminosilane covalently bonded to said reactive groups and a first amount of a polyfunctional reactant covalently bonded to said aminosilane and to said first amount of an enzyme and a second amount of the same or a different enzyme immobilized to said composite by a second amount of a polyfunctional reactant covalently bonded to said first amount of enzyme and to said second amount of enzyme, said enzymes substantially retaining their activities.

4,506,016

HEPATITIS-A VIRUSES ADAPTED TO HUMAN FIBROBLAST CELLS

Bertram Flehmig, Horemer 21, D-7400 Tübingen, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,524

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135599

Int. Cl.³ C12N *7/08;* **A61K** *39/29*

U.S. Cl. 435—237 **17 Claims**

1. A process which comprises culturing unmodified HAV on human kidney cells (HKC) and harvesting the thus-produced viruses.

10. Modified HAV adapted to HKC (HAV/HKC) and having a rate of growth and/or a rate of proliferation significantly greater than that of unmodified HAV cultured on HKC.

11. A process which comprises culturing the modified virus of claim 10 on human fibroblast strains (HFS).

4,506,017

MODIFIED *PASTEURELLA HAEMOLYTICA* BACTERIA

Carrell J. Kucera, Lincoln, Nebr., assignor to Norden Laboratories, Inc., Lincoln, Nebr.

Division of Ser. No. 255,145, Apr. 17, 1981, Pat. No. 4,388,299. This application Jan. 19, 1983, Ser. No. 459,274

Int. Cl.³ C12N *1/20, 15/00*

U.S. Cl. 435—253 **1 Claim**

1. *Pasteurella haemolytica* having all of the identifying characteristics of ATCC 31612.

4,506,018

BLOOD DILUENT

Howard L. North, Jr., Newfoundland, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Dec. 30, 1982, Ser. No. 454,793

Int. Cl.³ G01N *33/16*

U.S. Cl. 436—10 **7 Claims**

1. A multi-purpose isotonic blood diluent composition for use in particle counting instrumentation, which diluent brings about rapid mean corpuscular volume stability, characterized by

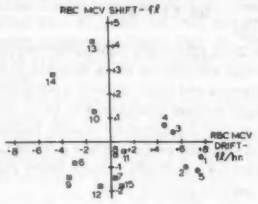
(a) electrolytes selected from the group consisting of sodium chloride and potassium chloride, and mixtures thereof;

(b) pH buffers selected from the group consisting of mono-

basic phosphate and dibasic phosphate and mixtures thereof;

(c) ethylene diamine tetraacetic acid;

(d) a preservative; and



(e) an ethylene oxide-polypropylene condensation product present in an amount effective to balance the mean corpuscular volume of red blood cells added to the diluent in the presence of said preservative,

(f) whereby to bring about said rapid mean corpuscular volume stability.

4,506,019

ACTIVATED POLYMER CONTAINER MEANS AND ASSAY METHOD EMPLOYING THE SAME

Jin P. Lee, Troy, Mich., assignor to Leeco Diagnostics, Inc., Southfield, Mich.

Filed Sep. 24, 1982, Ser. No. 422,801

Int. Cl.³ G01N *33/54*; B65D *71/00*; G01N *23/06*

U.S. Cl. 436—500 **20 Claims**

1. Means for the determination of ligand content in aqueous samples, comprising:

a plurality of molded polyamide polymer test tubes made by molding polymeric polyamide plastic feed stock at controlled mold temperature for stability such that each has a ligand-free inner wall surface of given area formed with thermally activated ligand-specific binding sides whereby the ligand binding capacity for assay purposes is uniform from tube to tube,

a first reagent comprising labeled ligand,

a second reagent comprising ligand binding protein,

the first reagent being intended to be contacted in respective ones of the test tubes with a sample containing the ligand and with the second reagent to bind part of the labeled and unlabeled ligand to the wall surface of each such test tube to produce a two-phase system, the two-phase system comprising a solid phase and a liquid phase wherein the solid phase includes the bound part of the labeled and unlabeled ligand and the liquid phase includes the unbound labeled and unlabeled ligand, and the label value of each phase when separated being a function of the ligand concentration that is referable to standards and controls.

12. An assay method for the determination of ligand content in aqueous samples which comprises:

providing a plurality of molded polyamide polymer test tubes made by molding polymeric plastic feed stock at controlled mold temperatures for stability such that the resulting tubes each have a ligand-free inner wall surface of given area formed with thermally activated ligand-specific binding sites whereby the ligand binding capacity for assay purposes is uniform from tube to tube,

providing a tube set comprising said tubes each containing an aqueous sample of unlabeled ligand in admixture with labeled ligand binding protein, and further ones of said tubes containing comparable standards and controls

incubating the mixtures contained in the tubes to achieve an end point wherein labeled and unlabeled ligand is bound to the respective tubes as a solid phase while unbound labeled and unlabeled ligand remains in the respective tubes as a liquid phase,

separating the respective solid and liquid phases for each sample, and

measuring the ligand content with respect to each sample as a function of the label value of at least one of the phases for that sample in relation to the standards and controls.

4,506,020

METHODS OF FORMING CERAMIC MATERIALS AND CERAMIC PRODUCTS, AND CERAMIC MATERIALS AND CERAMIC PRODUCTS FORMED THEREBY

Edwin G. Butler, Hatton, and Andrew Szweda, Dudley, both of England, assignors to Lucas Industries, Birmingham, England

Filed Feb. 23, 1983, Ser. No. 468,949

Claims priority, application United Kingdom, Feb. 26, 1982, 8206000; Aug. 25, 1982, 8224429

Int. Cl.³ C04B *35/18*

U.S. Cl. 501—97 **22 Claims**

1. A method of producing a dense ceramic product comprising the steps of mixing between 5 percent by weight and 96.5 percent by weight of a ceramic powder containing a major proportion of an alpha-phase substituted silicon nitride obeying the formula $M_x(Si,Al)_{12}(O,N)_{16}$, where x is greater than zero but not greater than 2 and M is a modifying cation with at least one nitride of silicon in an amount up to 86.7 percent by weight of the mixture and/or alumina wherein the alumina represents not more than 10% by weight of the mixture; and sintering the mixture in a non-oxidising atmosphere at a temperature of 1700° C. to 1900° C. so as to produce (1) a dense ceramic product consisting essentially of beta-phase substituted silicon nitride having the general formula $Si_{6-z}Al_zN_{8-z}O_z$, where z is greater than zero and not greater than 1.5, and a minor amount of a further phase containing said modifying cation M, or (2) a dense ceramic product consisting essentially of said beta-phase substituted silicon nitride, a controlled amount of an alpha-phase substituted silicon nitride obeying said formula $M_x(Si,Al)_{12}(O,N)_{16}$ and a minor amount of a further phase containing said modifying cation M.

4,506,021

O'-PHASE SIALON CERAMIC PRODUCT AND A METHOD OF FORMING DENSE CERAMIC PRODUCT

Kenneth H. Jack, North Shields, England, and Mark B. Trigg, St. Ives, Australia, assignors to Lucas Cookson Syalon Limited, Birmingham, England

Filed Feb. 10, 1984, Ser. No. 579,172

Claims priority, application United Kingdom, Feb. 26, 1983, 8305412

Int. Cl.³ C04B *35/58*

U.S. Cl. 501—98 **24 Claims**

1. A silicon aluminium oxynitride product containing from 80% to 98% by weight of O'-phase silicon aluminium oxynitride as a first phase and 20% to 2% by weight of at least one second phase which contains silicon and at least one metal other than silicon or aluminium, said percentages being based on the total weight of said first and second phases, said product being from about 85% to about 99% of theoretical density and having a microstructure which is a crystallised network of said O'-phase silicon aluminium oxynitride with said at least one second phase as a grain boundary phase.

4,506,022

SLIDE GATES

Dwight S. Whittemore, Bethel Park, and David J. Michael, White Oak Boro, both of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 16, 1983, Ser. No. 532,868

Int. Cl.³ C04B *35/52*

U.S. Cl. 501—100 **5 Claims**

1. High alumina slide gate composition comprising about 20 to 40%, by weight, of aluminous grain, about 2 to 10%, by weight, of carbonaceous material, about 40 to 60%, by weight,

of high purity alumina, about 1 to 5% of silicon metal and about 3 to 5%, by weight, of liquid thermosetting resin.

4,506,023

MOULDABLE REFRACTORY COMPOSITION BASED ON PARTIALLY STABILIZED ZIRCONIA AND ON AN ALUMINOUS HYDRAULIC BINDER, ITS PREPARATION AND MOULDINGS MANUFACTURED FROM THIS COMPOSITION

Jacques Guigonis, Entraigues-sur-Sorgues, France, assignor to Societe Europeenne des Produits Refractaires, Courbevoie, France

Filed Sep. 21, 1983, Ser. No. 534,504
Claims priority, application France, Sep. 22, 1982, 82 15942
Int. Cl.³ C04B *35/48*
U.S. Cl. 501—104 **4 Claims**

1. Refractory composition consisting essentially of:

(a) 96 to 98% by weight of zirconia partially stabilised by calcium oxide, magnesium oxide or yttrium oxide, at least 90% of which has a particle size of between 0.1 and 10 μm, and

(b) 2 to 4% by weight of an aluminous hydraulic binder,

this composition also having the following overall chemical analysis (within the limits of precision of the analysis):

1.4 to 3.2% by weight of Al_2O_3,

3.7 to 4.6% by weight of CaO, or 0.36 to 1.15% by weight of CaO plus 2.7 to 3.5% by wight of MgO, or 0.36 to 1.15% by weight of CaO plus 5.36 to 8.80% by weight of Y_2O_3,

less than 1% by weight of $SiO_2+Na_2O+Fe_2O_3+TiO_2$ taken together,

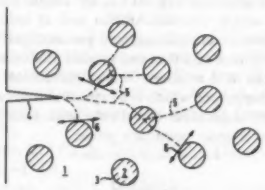
and ZrO_2 to make up to 100%.

4,506,024

CERAMIC FORMED BODY WITH A HIGH CRACK ARRESTABILITY

Nils Claussen, Leonberg, and Günter Petzow, Leinfelden-Echterdingen, both of Fed. Rep. of Germany, assignors to Max-Planck-Institut zur Foerderung der Wissenschaften e.V., Gottingen, Fed. Rep. of Germany

Filed Sep. 1, 1983, Ser. No. 528,466
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1982, 3233019
Int. Cl.³ C04B *35/00*
U.S. Cl. 501—105 **12 Claims**



1. Ceramic formed body comprising a ceramic matrix and at least one phase of ceramic incorporation material dispersed therein, characterized by a dense, microcrack-free ceramic base-matrix, containing a dispersion of predominantly tetragonal zirconium dioxide particles with a particle size of less than 1 μm, and compressive zones incorporated in the base-matrix which zones consist of a mixture of the base matrix material with unstabilized zirconium dioxide particles which are predominantly monoclinic at ambient temperature.

4,506,025

SILICA CASTABLES

Thomas R. Kleeb, Pittsburgh; George H. Criss, and Donald O. McCreight, both of Bethel Park, all of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 22, 1984, Ser. No. 592,133
Int. Cl.³ C04B *35/14*
U.S. Cl. 501—124 **8 Claims**

1. A castable silica refractory consisting essentially of 58–78 by weight percent amorphous silica selected from the group consisting of vitreous and fused silica or a combination thereof; 10 to 30 by weight percent quartzite; 4 to 10 by weight percent volatilized silica; 2 to 3 percent by weight wollastonite powder; and 1 to 3 by weight percent white portland cement; plus as additions about 0.4 by weight percent water reducing agent and 6 to 10 by weight percent water.

4,506,026

LOW FIRING CERAMIC DIELECTRIC FOR TEMPERATURE COMPENSATING CAPACITORS

Charles E. Hodgkins, Lewiston; Daniel C. Rose, Ransomville, both of N.Y., and Dana L. Coller, Clemson, S.C., assignors to TAM Ceramics, Inc., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 452,160, Dec. 22, 1982, abandoned. This application Dec. 23, 1983, Ser. No. 564,885
Int. Cl.³ C04B *35/46*; H01B *3/12*
U.S. Cl. 501—135 **24 Claims**

1.A dielectric ceramic composition comprising about 91 to about 93 weight percent of a base composition and about 7 to about 9 weight percent of a frit wherein said base composition, based on said ceramic composition weight, comprises about 28 to about 36 weight percent magnesium oxide, about 31 to about 39 weight percent titanium oxide, about 1 to about 4 weight percent calcium oxide, about 3 to about 5 weight percent alumina, about 12 to about 16 weight percent silica and about 1 to about 3 weight percent of the oxide of at least one rare element selected from the group consisting of niobium, tantalum, lanthanum, neodymium, yttrium and praseodymium.

4,506,027

METHOD OF PREPARING A SUPPORTED ZIEGLER-CATALYST FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Renzo Invernizzi, Milan, and Ferdinando Ligorati, Usmate, both of Italy, assignors to Enichimica Secondaria S.p.A., Palermo, Italy

Filed Nov. 10, 1983, Ser. No. 550,422
Claims priority, application Italy, Nov. 11, 1982, 24177 A/82
Int. Cl.³ C08F *4/64, 4/02*
U.S. Cl. 502—9 **8 Claims**

1. Method of preparing a supported Ziegler-catalyst, active in the polymerisation of alpha-olefins, characterised by reacting in an inert solvent an organometallic compound of aluminium and an activated solid support obtained by spray-drying of a solution of magnesium chloride in a mixture of ethanol and methanol in a weight ratio of ethanol to methanol from 0.5:1 to 2.5:1, to a solid support containing ethanolic and methanolic alcoholic hydroxyl groups in an amount of from 2% to 30% by weight, expressed as the sum of ethanol and methanol content, and then reacting the said solid support with a titanium halide and a vanadium halide in the presence of an inert diluent, at a temperature of from 20° C. to 120° C., for a period of time of from 2 to 120 minutes, so to fix to the said solid support an amount of from 0.7% to 12% by weight (expressed as the sum of the metals) of titanium and vanadium, the weight ratio of titanium to vanadium being from 0.5:1 to 2.5:1.

4,506,028

PROCESS FOR PREPARING A FUEL CELL ELECTRODE SUBSTRATE COMPRISING CARBON FIBERS

Hiroyuki Fukuda; Hisatsugu Kaji, both of Iwaki; Hiroto Fujimaki, Tokyo; Yoichiro Yamanobe, Iwaki; Masaru Hiruta, Iwaki, and Sigeru Ohmi, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Dec. 17, 1982, Ser. No. 450,802

Claims priority, application Japan, Dec. 29, 1981, 56-214258

Int. Cl.³ H01M *4/96;* C01B *31/02;* D01F *9/12;* B29C *25/00*

U.S. Cl. 502—101 4 Claims

1. A process for preparing a fuel cell electrode substrate, comprising mixing (a) 30–50% by weight of carbon fibers having a diameter of 5–30μ, a length of 0.05–2 mm and a linear carbonizing shrinkage on calcinating at 2,000° C. of 0.1–3.0%, (b) 20–50% by weight of a carbonaceous resin binder having a carbonizing yield of 30–75% by weight, and (c) 20–50% by weight of an organic granule for controlling the production of pores in the product electrode substrate which has a carbonizing yield of at most 30% by weight and a diameter of 30–300μ and does not evaporate nor melt nor flow at 100° C., press-shaping the resultant mixture at a temperature of 100°–200° C. under a pressure of 5–100 kg/cm^2 for 2–60 minutes, curing the shaped product at about 150° C. under about 0.5 kg/cm^2 for 0.5–10 hours per 1 mm in thickness of the shaped product, calcinating the cured product at a temperature of 1,000°–3,000° C. under an inert atmosphere for 0.5–5 hours and thereafter recovering an electrode substrate having a porosity of 40 to 85%, a bending strength of at least 80 kg/cm^2, a gas permeability of 100 to 1000 ml/cm^2.hr.mm.Aq and a bulk resistance of at most 5×10^{-2} Ωcm.

2. The process of claim 1, wherein the weight ratio of the total amount of the carbon fibers and the organic granule to the amount of the binder is 1.5–4.0.

3. The process of claim 1, wherein the binder is a phenol resin or a mixture of a phenol resin and pitch.

4,506,029

SUPPORTED CATALYST FOR POLYMERIZATION OF OLEFINS

Elliot I. Band, Yonkers, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 20, 1982, Ser. No. 451,629

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—111 24 Claims

1. A catalytic component for polymerizing olefins comprising a solid support comprising magnesium-halogen and/or manganese-halogen bonds, a transition metal halide of a metal selected from Groups IVB and VB of the periodic table, and electron donors obtained by steps comprising:

(a) contacting a mixture comprising a magnesium halide and/or manganese halide and at least one electron donor with a $Ti(OR)_4$ compound to form a solution, where R is a hydrocarbyl and/or halogenated hydrocarbyl moiety containing 1–20 carbon atoms, and

(b) reacting the solution with a reagent comprising a transition metal halide of a metal selected from Groups IVB and VB of the periodic table.

4. A catalytic component as in claim 1 wherein one of the electron donors comprises a phenol.

4,506,030

CATALYSTS FOR HYDROGENATION OF AROMATIC COMPOUNDS

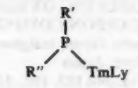
Richard A. Jones, Austin, Tex., assignor to The Board of Regents, University of Texas System, Austin, Tex.

Filed Feb. 17, 1984, Ser. No. 581,422

Int. Cl.³ C07F *4/02*

U.S. Cl. 502—155 15 Claims

10. A catalyst which has the formula



where

R′ is a methylated styrene-divinyl benzene copolymer;

R″ is an alkyl or aryl group;

Tm is selected from the group consisting of iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, and platinum; and

Ly is any functionality capable of bonding to a d-block transition metal.

4,506,031

MICROENCAPSULATED AQUEOUS POLYMERIZATION CATALYST

James N. Henderson, Hudson; Ken W. Donbar; John J. Barbour, both of Akron, and Anthony J. Bell, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 419,261, Sep. 17, 1982, Pat. No. 4,429,085. This application Jan. 18, 1984, Ser. No. 571,756

Int. Cl.³ C08F *4/26*

U.S. Cl. 502—162 17 Claims

1. An aqueous polymerization medium comprising a catalyst composition which contains (a) an organometallic compound selected from the group consisting of organoaluminum compounds of the formula AlR_3, organomagnesium compounds of the formula MgR_2, and organolithium compounds of the formula LiR, wherein R represents a hydrocarbon radical of 1 to 6 carbon atoms and (b) a cobalt compound selected from the group consisting of (i) β-diketone complexes of cobalt, (ii) β-keto acid ester complexes of cobalt, (iii) cobalt salts of organic carboxylic acids having 6 to 15 carbon atoms, and (iv) complexes of halogenated cobalt compounds of the formula CoX_n, wherein X represents a halogen atom and n represents 2 or 3, with an organic compound selected from the group consisting of tertiary amine alcohols, tertiary phosphines, ketones and N,N-dialkylamides; wherein said catalyst composition is microencapsulated in a polyene product; and wherein said catalyst composition is dispersed in water.

4,506,032

DEHYDROGENATION CATALYST COMPOSITION

Tamotsu Imai, Mt. Prospect, Ill., and Chi-Wen Hung, San Rafael, Calif., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 477,699, Mar. 22, 1983, Pat. No. 4,430,517, which is a continuation-in-part of Ser. No. 326,969, Dec. 2, 1981, abandoned. This application Oct. 14, 1983, Ser. No. 541,858

Int. Cl.³ B01J *27/04, 27/08, 27/10*

U.S. Cl. 502—223 14 Claims

1. A catalyst composition comprising a platinum group component, a Group IVA component, an alkali or alkaline earth component, more than 0.2 weight %, calculated on an elemental basis, of a halogen component and a porous carrier material, wherein the atomic ratio of the alkali or alkaline earth component to the platinum group component is more than 10.

12. The composition of claim 1 which also comprises a sulfur component.

4,506,033
PROCESS FOR PRODUCING OXYGEN-CONTAINING HYDROCARBON COMPOUNDS

Masaru Ichikawa, Yamato, Japan, assignor to Sagami Chemical Research Center, Tokyo, Japan

Continuation of Ser. No. 348,193, Feb. 12, 1982, abandoned, which is a continuation of Ser. No. 165,005, Jul. 1, 1980, abandoned. This application Jul. 29, 1983, Ser. No. 517,990
Claims priority, application Japan, Jul. 3, 1979, 54-83521; Oct. 3, 1979, 54-126823
Int. Cl.³ C07C *27/06*
U.S. Cl. 518—716 **8 Claims**

1. In a process for producing an oxygen-containing hydrocarbon compound having 1 or 2 carbon atoms which comprises reacting a gaseous mixture of a carbon oxide and hydrogen in the presence of a hydrogenation catalyst, the improvement wherein said hydrogenation catalyst is a catalyst composition consisting of

(i) metallic rhodium,

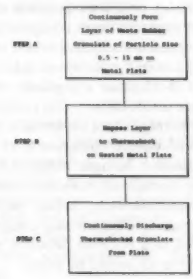
(ii) an elemental metal selected from the group consisting of niobium, tantalum, manganese and rhenium, and

(iii) a catalytically active oxide of zirconium.

4,506,034
METHOD FOR THE CONTINUOUS PROCESSING OF COARSE-GRAINED WASTE RUBBER INTO A SECONDARY RUBBER RAW MATERIAL

Pavel Munih, Kranj, Yugoslavia, assignor to SAVA KRANJ industrija gumijevih, usnjenih in kemicnih izdelkov n.o.sol.o., Kranj, Yugoslavia

Filed Nov. 29, 1982, Ser. No. 444,934
Int. Cl.³ C08J *11/00, 11/02, 11/04*
U.S. Cl. 521—41 **11 Claims**



1. A method for processing coarse-grained waste rubber to provide a secondary rubber raw material which comprises:

providing a single layer of coarse-grained waste rubber particles having particle sizes of 0.5 to 15 mm wherein the thickness of said layer does not exceed the largest dimension of a single waste rubber particle;

exposing said layer to thermoshock at a temperature of 200° to 900° C. for 5 to 200 seconds, whereby the access of oxygen to said waste rubber particles is impeded by the stripping of the volatile ingredients form the waste rubber particles during thermoshock.

10. A method for processing coarse-grained waste rubber to provide a secondary rubber raw material which comprises:

continuously charging waste rubber particles on to a heat plate to provide a single layer of rubber particles having particle sizes of 0.5 to 15 mm., wherein the thickness of said layer does not exceed the largest dimension of a single waste rubber particle; exposing said layer to thermoshock at a temperature of 200° to 900° C. for 5 to 200 seconds, whereby the access of oxygen to the waste rubber particles is impeded by the stripping of the volatile ingredients from the waste rubber particles during thermoshock; continuously discharging the thermoshocked waste rubber particles from the heat plate.

4,506,035
MICROPOROUS HYDROPHILIC FLUOROPOLYMER MEMBRANES AND METHOD

George H. Barnett, North Balwyn, and Michael V. Markus, East Malvern, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

PCT No. PCT/AU82/00103, § 371 Date Feb. 17, 1983, § 102(e) Date Feb. 17, 1983, PCT Pub. No. WO83/00157, PCT Pub. Date Jan. 20, 1983
PCT Filed Jun. 25, 1982, Ser. No. 473,160
Claims priority, application Australia, Jun. 26, 1981, PE9455
Int. Cl.³ C08J *9/36;* C08F *8/00, 259/08*
U.S. Cl. 521—53 **29 Claims**

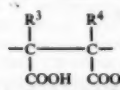
1. An hydrophilic fluoropolymeric microporous diaphragm comprising a fluorine-containing polymeric substrate to which has been radiation co-grafted a mixture of monomers comprising at least one functional monomer selected from the group consisting of compounds of formula I

$$CF_2{=}CF(CF_2)_nA,$$

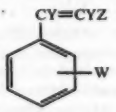
and formula II

$$CF_2{=}CF{-}O{-}(CFX{-}CFX)_mA$$

wherein A is carboxyl, alkoxycarbonyl, hydroxyalkoxy, carbonyl, cyano, hydroxsulfonyl, fluorosulfonyl, or the group $-CO-NR^1R^2$ wherein R^1 and R^2 are independently selected from hydrogen and C_1 to C_6 alkyl, one X is fluorine and the other X is selected from chlorine fluorine and a trifluoromethyl group, n is an integer from 1 to 12, m is an integer from 1 to 3, and unsaturated dicarboxylic acids or derivatives thereof containing the group of formula III



wherein R^3 and R^4 are independently selected from hydrogen, fluorine, chlorine, and C_1 to C_6 alkyl or halogenated C_1 to C_6 alkyl or together form a double bond; and at least one non-functional monomer selected from the group consisting of aliphatic vinyl monomers of formula IV and aromatic vinyl monomers of formula V



wherein Y is hydrogen or fluorine, Z is hydrogen, fluorine or chlorine, and W is hydrogen, C_1 to C_6 alkyl, C_2 to C_6 alkenyl, halogenated C_1 to C_6 alkyl or halogenated C_2 to C_6 alkenyl; and wherein the molar ratio of co-grafted functional monomer to co-grafted non-functional monomer is in the range of 2:1 to 1:20.

16. A process of preparing an hydrophilic fluoropolymeric microporous diaphragm which process comprises radiation co-grafting onto a fluorine-containing polymeric diaphragm a mixture of monomers comprising at least one functional monomer selected from the group consisting of compounds of formula I

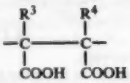
$$CF_2{=}CF(CF_2)_nA,$$

and formula II

$$CF_2{=}CF{-}O{-}(CFX{-}CFX)_mA$$

wherein A is carboxyl, alkoxycarbonyl, hydroxyalkoxy, car-

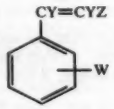
bonyl, cyano, hydroxysulfonyl, fluorosulfonyl, or the group —CO—NR^{1}R^2 wherein R^1 and R^2 are independently selected from hydrogen and C_1 to C_6 alkyl, one X is fluorine and the other X is selected from chlorine fluorine and a trifluoromethyl group, n is an integer from 1 to 12, m is an integer from 1 to 3, and unsaturated dicarboxylic acids or derivatives thereof containing the group of formula III



wherein R^3 and R^4 are independently selected from hydrogen, fluorine, chlorine, and C_1 to C_6 alkyl or halogenated C_1 to C_6 alkyl or together form a double bond; and at least one nonfunctional monomer selected from the group consisting of aliphatic vinyl monomers of formula IV

$$CY_2{=}CYZ$$

and aromatic vinyl monomers of formula V



wherein Y is hydrogen or fluorine, Z is hydrogen, fluorine or chlorine, and W is hydrogen, C_1 to C_6 alkyl, C_2 to C_6 alkenyl, halogenated C_1 to C_6 alkyl or halogenated C_2 to C_6 alkenyl; and wherein the molar ratio of functional monomer to nonfunctional monomer is in the range of 1:20 to 9:1.

4,506,036

STABLE BORON RESINS OF HIGH SELECTIVE ABSORBENT POWER

Andrea Filippini, Prato, and Renato Carobbi, Pistoia, both of Italy, assignors to Sirac S.p.A., Milan, Italy

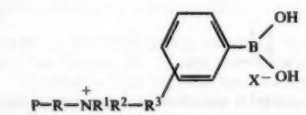
Filed Jul. 16, 1984, Ser. No. 631,104

Claims priority, application Italy, Mar. 22, 1984, 20177 A/84

Int. Cl.^{3} C08J *9/36*

U.S. Cl. 521—53 **7 Claims**

1. A process for producing a porous boron resin having an average pore size diameter of between 500 and 1500 A of the formula



(I)

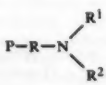
in which

Ⓟ is a polyacrylic matrix;

R and R^3, which can be the same or different, are —$(CH_2)_n$— where n is between 0 and 5;

R^1 and R^2, which can be the same or different, are C_1–C_5 alkyl;

X$^-$ is an anion chosen from the group consisting of OH and halides, characterised in that an amino resin of formula



(II)

in which Ⓟ, R, R^1 and R^2 are as heretofore defined, is suitably pretreated and then condensed with a phenylboroxine of formula

$$(YR^3{-}C_6H_4{-}B{-}O)_3 \qquad \text{(III)}$$

in which Y is a halogen and R^3 is as heretofore defined, in an organic medium in the presence of an alkaline iodide as catalyst at a temperature of between 25° and 55° C., and the resultant resin of formula (I) in which X is a halogen is possibly transformed into the corresponding resin in which X is OH by treatment with an aqueous alkaline hydroxide solution.

4,506,037

PRODUCTION OF RESIN FOAM BY AQUEOUS MEDIUM

Shigemasa Suzuki, Koshigaya, and Toshiyuki Takai, Kounosu, both of Japan, assignors to Chuo Kagaku Co., Ltd., Japan

Filed Mar. 15, 1984, Ser. No. 590,914

Claims priority, application Japan, Mar. 23, 1983, 58-47028; May 20, 1983, 58-87534

Int. Cl.^{3} C08J *9/22*

U.S. Cl. 521—82 **33 Claims**

1. A process for producing a resin foam by using an aqueous medium, which comprises

(a) treating a resin compound with said aqueous medium to cause the aqueous medium to adhere to and be held by the resin compound, said resin compound being composed of porous agglomerated particles resulting from partial melt-adhesion of thermoplastic resin particles coated with a fine hydrophilic solid powder which does not substantially melt at the melting temperature of the resin particles, said solid powder being embedded in the resin particles but partly exposed at their surfaces,

(b) melt-kneading the resin compound treated with the aqueous medium under such an elevated pressure that evaporation of the aqueous medium is substantially inhibited, and

(c) thereafter releasing the kneaded resin composition from the pressurized state to foam it.

4,506,038

DEVELOPMENT OF POLYIMIDE FOAMS WITH BLOWING AGENTS

John Gagliani, San Diego, Calif.; Usman A. K. Sorathia, Schaumburg, and Raymond Lee, Elk Grove Village, both of Ill., assignors to I M L Corporation, Elk Grove Village, Ill.

Filed Dec. 3, 1982, Ser. No. 446,507

Int. Cl.^{3} C08J *9/10*

U.S. Cl. 521—103 **10 Claims**

1. A method of preparing a polyimide foam which includes the steps of: preparing, foaming, and curing a solvent-free precursor consisting essentially of at least one alkyl ester of 3,3'4,4'-benzophenonetetracarboxylic acid; a meta- or para-substituted aromatic diamine; a heterocyclic diamine; an aliphatic diamine; and a solid blowing agent, said blowing agent being present in said precursor in a concentration which is sufficient to affect at least one of the following attributes of the foam: cell size, proportion of open cells, cell density, and identation load deflection.

4,506,039

PROCESS FOR THE PRODUCTION OF POLYMER-CONTAINING AROMATIC POLYETHER POLYAMINES

Gerhard Ballé, Leverkusen; Werner Rasshofer, Cologne, both of Fed. Rep. of Germany, and Winfried Schoberth, Pittsburgh, Pa., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 20, 1982, Ser. No. 450,813

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1982, 3200021

Int. Cl.³ C08G 18/14, 67/02

U.S. Cl. 521—137 17 Claims

1. A process for the production of relatively low-viscosity modified polyether polyamines containing terminal amino groups in which a polyether polyamine having terminal amino aromatic groups, a molecular weight of from 800 to 10,000 and an aromatic amino group content of from 0.3 to 16 wt. % is subjected to radical in situ polymerization with an olefinically unsaturated monomer.

4,506,040

PREPARATION OF A STABLE DISPERSION FROM TDI RESIDUE AND ITS USE IN THE PRODUCTION OF POLYURETHANE COMPOSITIONS

Maurice C. Raes, Branford, and Oliver J. Proulx, Wallingford, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Aug. 1, 1983, Ser. No. 518,880

Int. Cl.³ C08G 18/30, 18/14, 18/76, 18/64

U.S. Cl. 521—137 42 Claims

1. A process for preparing a stable dispersion of a polymer in a high molecular weight polyol comprising the steps of:

(a) reacting TDI residue with an active hydrogen containing compound in an organic solvent and outside the presence of said high molecular weight polyol to form a dispersion of a polymer in said organic solvent, said TDI residue being a residual distilland obtained by distilling toluene diisocyanate from a reaction mixture resulting from phosgenating toluene diamine, and said active hydrogen containing compound being selected from the group consisting of water a short-chain polyol and mixtures thereof;

(b) adding said high molecular weight polyol to said dispersion in said organic solvent; and

(c) removing said organic solvent to produce a dispersion of said polymer in said high molecular weight polyol.

4,506,041

POWDERED BINDER FOR MOLD-MAKING AND A PROCESS FOR PREPARING A MOLD BY USING THE SAME

Takatoshi Tanigawa, Tokyo; Sakari Yaegashi, Ichikawa; Tetsuo Nakazawa, Ibaraki; Masahiko Hatazi, Suzuka, and Tadao Nango, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Kinsei Kogyo Co., Ltd., both of Tokyo, Japan

Filed Jun. 30, 1983, Ser. No. 509,394

Claims priority, application Japan, Jul. 5, 1982, 57-116454; Aug. 20, 1982, 57-143339

Int. Cl.³ B22C 1/00, 3/00

U.S. Cl. 523—139 17 Claims

1. A powdered binder which comprises an intimate mixture of a copolymer of maleic anhydride with an olefinically unsaturated compound selected from the group consisting of an aliphatic α-olefin having 2 to 8 carbon atoms, styrene and methyl vinyl ether, 0.2 to 2.0 equivalents of a caustic alkali per carboxyl equivalent of said copolymer and 0.3 to 5.0 parts by weight of an alkaline earth metal hydroxide per 1 part of the total weight of said copolymer and said caustic alkali.

4,506,042

CURABLE RESIN COMPOSITION COMPRISING N-(ALKENYLPHENYL)MALEIMIDE, EPOXY COMPOSITION AND POLYAMINE

Hikotada Tsuboi; Motoo Kawamata; Masayuki Oba, and Nobuhito Koga, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

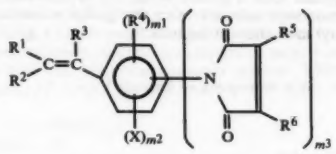
Division of Ser. No. 312,959, Oct. 20, 1981, Pat. No. 4,401,777. This application Apr. 4, 1983, Ser. No. 471,204

Int. Cl.³ C08L 63/00, 67/00, 77/00

U.S. Cl. 523—454 28 Claims

1. A curable resin composition comprising:

(a) at least one maleimide compound selected from the group consisting of N-(alkenylphenyl)maleimides represented by the general formula (I):

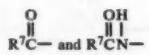


(I)

wherein R^1–R^6 are the same or different from one another and denote independently hydrogen, a hydrocarbon group having 1–20 carbon atoms, a halogen, R^7O— or

group where R^7 represents a hydrocarbon group having 1–20 carbon atoms or a hydrocarbon group having 1–20 carbon atoms and substituted by one or more halogen atoms, hydroxyl group, cyano group, or a hydrocarbon group substituted by one or more halogens, R^7O— or

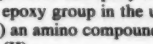
group, hydroxyl group or cyano group and having 1–20 carbon atoms prior to the substitution, a plurality of R^4s are the same or different when m^1 stands for a value of 2 or greater, R^3 is coupled with either R^1 or R^2, thereby forming a ring, X denotes at least one atom or group selected from hydrogen, halogens, hydroxyl groups, R^7O—



groups, where R^7 is as defined above, cyano group, nitro group or carboxyl group, a plurality of Xs are the same or different when m^2 stands for a value of 2 or greater, and m^1, m^2, and m^3 represent independently a positive integer and $m^1+m^2+m^3=5$, dimers of said maleimides and polymers of said maleimides having a polymerization degree of at least 3;

(b) at least one epoxy compound, each having at least one 1,2 epoxy group in the unit molecule thereof; and,

(c) an amino compound represented by the general formula (II):



(II)

wherein Q indicates an organic group having 1–150 carbon atoms and a valence of n, Q contains at least one kind of atom selected from hydrogen, oxygen, sulphur, halogen, nitrogen, phosphorus or silicon atoms, and n repre-

sents an integer of at least 1, and said composition contains at least one kind of a prepolymer of at least parts of any two components among components (a), (b) and (c).

4,506,043

GLASS FIBER-REINFORCED THERMOPLASTIC POLYESTER COMPOSITION

Yoshinari Ogawa; Kouichi Sakai, and Noriyuki Akagi, all of Sagamihara, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 252,118, Apr. 8, 1981,. This application Apr. 8, 1983, Ser. No. 481,444

Claims priority, application Japan, Apr. 11, 1980, 55-46797; Jun. 4, 1980, 55-74188

Int. Cl.[3] C08K 7/14

U.S. Cl. 523—523 13 Claims

1. A glass fiber-reinforced thermoplastic polyester composition composed of

(A) 100 parts by weight of a polyethylene terephthalate resin having an intrinsic viscosity, measured at 35° C. in orthochlorophenol, of from 0.4 to 0.9 and comprising at least 80 mole%, based on the total acid component, of terephthalic acid or an ester-forming derivative thereof and at least 80 mole%, based on the total polyol component, of ethylene glycol or an ester-forming derivative thereof,

(B) 5 to 200 parts by weight of glass fibers having an average length of at least 0.2 mm,

(C) 0.05 to 3 parts by weight of a partially esterified montan wax acid having a neutralization value (NV) and a saponification value (SV) which are in the following relation

$$50 \leqq NV \leqq 110 \quad (1)$$

$$100 \leqq SV \leqq 180 \quad (2)$$

$$10 \leqq (SV - NV) \leqq 100 \quad (3)$$

and

(D) at least one component selected from the group consisting of

(D_1) 0.01 to 3 parts by weight of a sodium or potassium salt of a monocarboxylic acid having 2 to 28 carbon atoms and

(D_2) 0.1 to 10 parts by weight of an ionic copolymer of an α-olefin and an α, β-unsaturated carboxylic acid, said copolymer containing a mono- to trivalent metal ion.

4,506,044

MICROBIAL HETEROPOLYSACCHARIDE

Roger B. Cox, Reading, and David C. Steer, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 331,705, Dec. 16, 1981, , which is a division of Ser. No. 166,220, Jul. 7, 1980, Pat. No. 4,329,448. This application Aug. 23, 1982, Ser. No. 410,771

Claims priority, application United Kingdom, Jul. 10, 1979, 7924040; Dec. 20, 1979, 7943878

Int. Cl.[3] C08K 5/04

U.S. Cl. 524—27 2 Claims

1. A process for the aqueous suspension polymerization of a liquid monomer to a particulate polymer in which the monomer is chosen from polymerizable derivatives of acrylic acid, or methacrylic acid or its polymerizable derivatives, or esters or ethers of vinyl alcohol, vinylidene chloride, styrene or methylstyrene, or mixtures thereof, the process comprising the step of conducting the polymerization in the presence of from 0.1 to 5% by weight of Biopolymer PS 87, expressed in terms of the weight of monomer present said Biopolymer PS 87 being a heteropolysaccharide which comprises from 40 to 45% by weight of glucose, from 10 to 20% by weight galactose, from 25 to 30% by weight mannose, from 6 to 13% by weight glucuronic acid and from 0 to 1.5% by weight fucose, a 1% by weight solution of said Biopolymer PS 87 having pseudoplastic properties, a consistency at 20° C. of at least 150 poise and a yield stress value at 20° C. of at least 30 dynes/cm^2.

4,506,045

CELLULOSE ESTER-ALIPHATIC POLYCARBONATE THERMOPLASTIC MOULDING COMPOSITIONS

Helmut Waniczek; Christian Lindner, both of Cologne; Carlhans Süling; Herbert Bartl, both of Odenthal, and Walter Uerdingen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,238

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1982, 3236521; Apr. 19, 1983, 3314188

Int. Cl.[3] C08L 1/10; G02B 1/04

U.S. Cl. 524—31 7 Claims

1. A thermoplastic moulding composition consisting of

I. from 1 to 99% by weight of at least one cellulose ester or cellulose mixed ester; and

II. from 99 to 1% by weight of an aliphatic polyester or polyether containing carbonate groups in the polymer chain as linkage and optionally standard auxiliaries and additives.

4,506,046

FLAME RETARDANT POLYCARBONATE COMPOSITIONS

Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 498,945, May 27, 1983, Pat. No. 4,469,833. This application Apr. 4, 1984, Ser. No. 596,656

Int. Cl.[3] C08K 5/42

U.S. Cl. 524—83 14 Claims

1. A flame retardant non-opaque polycarbonate composition consisting essentially of, in admixture:

(i) at least one halogen-free and sulfur containing aromatic polycarbonate resin derived from

(a) at least one halogen-free and sulfur-free non-polycyclic dihydric phenol,

(b) from about 4 to about 25 mole percent of at least one halogen-free thiodiphenol, based on the total amount of said halogen-free and sulfur-free non-polycyclic dihydric phenol and said halogen-free thiodiphenol employed, and

(c) a carbonate precursor; and

(ii) from about 0.001 to about 0.5 parts by weight per hundred parts by weight of said polycarbonate resin of at least one organic metal salt of sulfonic acid selected from the alkali and alkaline earth metal salts of sulfonic acids.

4,506,047

POLYCARBONATE COMPOSITIONS HAVING IMPROVED RIGIDITY

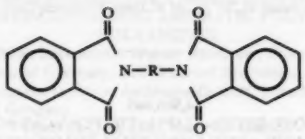
Mark W. Witman, Krefeld, Fed. Rep. of Germany, and Gerard E. Reinert, McMurray, Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jun. 6, 1983, Ser. No. 501,594

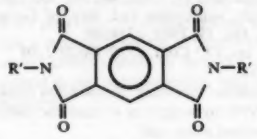
Int. Cl.[3] C08K 5/34; C08L 69/00

U.S. Cl. 524—89 4 Claims

1. A thermoplastic molding composition comprising an aromatic polycarbonate resin and about 1.0 to about 10.0%, relative to the weight of said polycarbonate resin, of at least one halogen-free bisimide compound selected from the group consisting of



wherein R denotes a divalent aliphatic, aromatic, cycloaliphatic or mixed aliphatic-aromatic radical having 1 to 20 carbon atoms and



wherein R' denotes a C_1–C_{20} alkyl, and cycloalkyl radical, said compound further characterized in that its melting temperature is at or below the melting temperature range of said polycarbonate resin.

3. The composition of claim 1 wherein said R is selected from the group consisting of $—CH_2CH_2—$, $—CH_{2—6}$, and $—CH_{2—12}$.

4,506,048

AGENTS FOR PREPARING CROSS-LINKED POLYMERS AND PAINT AND PLASTIC COMPOSITIONS CONTAINING THOSE AGENTS

Rodney D. Bush, Cincinnati, Ohio, and Medford D. Robbins, Whitewater Township, Franklin County, Ind., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 290,918, Aug. 7, 1981, Pat. No. 4,427,835. This application Oct. 31, 1983, Ser. No. 547,284

Int. Cl.³ C08K *5/34*

U.S. Cl. 524—100 **35 Claims**

1. A composition comprising an agent for preparing crosslinked polymers comprising:

(a) a major portion of a polymer selected from the group consisting of polyacrylates and polymethacrylates having a molecular weight of from about 1,000 to about 10,000, this portion constituting the backbone of said agent; and

(b) a minor portion of mono- or disubstituted olefinic groups pendant from said backbone, with the olefinic substituents on the groups being unpolymerized, said groups having polymerization rate constants of from about 10×10^{-4} to about 1000×10^{-4} $mole^{-1}$ $liter^{1}$ $minute^{-1}$ at 70° C.;

together with an amount of a catalyst sufficient to crosslink from about 2% to about 60% of the pendant groups of said agent within about 48 hours upon exposure to oxygen, heat, light or ultraviolet radiation.

4,506,049

THERMOPLASTIC PVC MOLDING COMPOSITIONS CONTAINING A PHOSPHITE COMPOUND

Warren B. Mueller, and Jesse D. Jones, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed May 16, 1983, Ser. No. 494,917

Int. Cl.³ C08K *5/04;* **C08L** *25/08, 27/06, 51/04*

U.S. Cl. 524—139 **48 Claims**

1. A thermoplastic molding composition which comprises in intimate admixture:

(a) a vinyl chloride polymer having a relative viscosity, as measured at a concentration of 1 gram per 100 grams of cyclohexanone at 25° C., falling within the range of from about 1.50 to about 1.85;

(b) a copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride having a number average molecular weight of at least 30,000 and in which the content of said vinyl aromatic compound is within the range of from about 90 to about 70 weight percent and the content of said anhydride is within the range of from about 10 to about 30 weight percent;

(c) a styrene-maleic anhydride copolymer having a number average molecular weight within the range of from about 1000 to about 8000; and

(d) an alkyl diphenyl phosphite in which the alkyl group has from about 6 to about 18 carbon atoms.

4,506,050

POLYETHYLENE TEREPHTHALATE MOLDING COMPOSITIONS

William L. Hergenrother, and John M. Doshak, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 391,200, Jun. 23, 1982, Pat. No. 4,440,889. This application Dec. 5, 1983, Ser. No. 558,121

Int. Cl.³ C08K *5/52*

U.S. Cl. 524—143 **11 Claims**

1. Polyethylene terphthalate molding compositions which can be molded at temperatures of 100° C. or less comprising:

(a) from about 40 to about 70 parts by weight per 100 parts of total composition of a polyethylene terephthalate having an intrinsic viscosity of 0.4 to 1.0 dl/g as measured at 25° C. in a 1:1 mixture of phenol and tetrachloroethane;

(b) from about 0.5 to about 5.0 parts by weight per 100 parts by weight of total composition of a plasticizer selected from the group consisting of dioctyl phthalate, butyl benzyl phthalate and phosphate esters;

(c) from about 0.5 to about 10.0 parts by weight per 100 parts by weight of total composition of a lubricating polymer;

(d) from about 0.1 to about 5.0 parts by weight per 100 parts by weight of total composition of a nucleating agent;

(e) from about 20 to about 60 parts by weight per 100 parts by weight of total composition of a reinforcing material or mixture of reinforcing material and filler; and

(f) from about 0.01 to about 1.0 parts by weight per 100 parts by weight of total composition of a molecular weight reducing agent for said polyethylene terephthalate, wherein said molecular weight reducing agent is selected from the group consisting of neopentyl glycol and water.

4,506,051

WATER-IN-OIL EMULSIONS HAVING IMPROVED LOW TEMPERATURE PROPERTIES

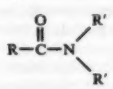
Robert W. Rance, Bühl, Fed. Rep. of Germany, assignor to Dow Chemical Rheinwerk GmbH, Midland, Mich.

Filed Sep. 9, 1983, Ser. No. 530,794

Int. Cl.³ C08K *5/20*

U.S. Cl. 524—233 **9 Claims**

1. A water-in-oil emulsion composition comprising a self-inverting water-in-oil emulsion of a water-soluble polymer having an amount of an N,N-dialkyl amide of the formula:



wherein R is alkyl, alkenyl, cycloalkyl, aryl or inertly substituted alkyl, alkenyl, cycloalkyl or aryl having at least 5 carbon atoms and each R' is independently an alkyl, said amount being sufficient to improve the low temperature properties of the emulsion such that the emulsion is flowable at a lower temperature than if no N,N-dialkyl amide was employed or the emulsion is more stable when subjected to freeze thaw cycles than if no N,N-dialkyl amide was employed.

4,506,052

ONE COMPONENT ROOM TEMPERATURE SETTING COMPOSITION

Hisao Furukawa, and Yasushi Kato, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 402,221, Jul. 27, 1982, Pat. No. 4,451,602. This application Feb. 29, 1984, Ser. No. 584,858
Claims priority, application Japan, Jul. 27, 1981, 56-118354
Int. Cl.³ C08K 5/07
U.S. Cl. 524—357 9 Claims

1. A one component room temperature setting composition which comprises:

(A) a vinyl polymer having on the polymer chain end or the side chain thereof at least one silyl group having a hydrolyzable group per one polymer molecule, the main chain of the vinyl polymer consisting essentially of a polymer of a vinyl compound,

(B) 0.005 to 10 parts of a hardener,

(C) 0 to 200 parts of a pigment, and

(D) 0.1 to 100 parts of at least one member selected from the group consisting of an orthoformic acid ester of the general formula:

$$HC(OR^1)_3$$

wherein R^1 is a monovalent hydrocarbon group having 1 to 16 carbon atoms selected from the group consisting of an alkyl group, an aryl group, a halogenated alkyl group and a halogenated aryl group, and

a β-diketone compound of the general formula:

$$R^3—\overset{\overset{O}{\|}}{C}—CH_2—\overset{\overset{O}{\|}}{C}—R^4$$

wherein R^3 and R^4 are each a monovalent hydrocarbon group having 1 to 16 carbon atoms selected from the group consisting of an alkyl group, an aryl group, a halogenated alkyl group and a halogenated aryl group, said parts being parts by weight per 100 parts by weight of the component (A).

9. The composition of claim 1, wherein said β-diketone compound is combined with at least one member selected from the group consisting of (a) a hydrolyzable silicon compound of the general formula:

$$X^1_{4-n}—Si—R_n^2$$

wherein R^2 is an organic group bonding to the silicon atom through a carbon atom, X^1 is a hydrolyzable group selected from the group consisting of an alkoxyl group, an alkoxyalkoxyl group, phenoxy group, an acyloxyl group, a ketoxymate group, amino group, aminoxy group, an acid amido group and an alkenyloxy group, and n is 0 or an integer of 1 to 3, and (b) a partial hydrolysis product of the hydrolyzable silicon compound.

4,506,053

ACETAL RESIN COMPOSITION

Masanori Sakurai; Junichi Miyawaki; Toshikazu Umemura; Toshikatsu Kawata; Shinzi Kiboshi, all of Toyonaka, and Akiyoshi Shibata, Miki, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 559,028
Claims priority, application Japan, Dec. 7, 1982, 57-214530
Int. Cl.³ C08K 3/22, 3/34, 3/30; C08L 59/02
U.S. Cl. 524—405 15 Claims

1. An acetal resin composition comprising

(A) an acetal resin which is a homopolymer or copolymer containing oxymethylene units,

(B) at least one member selected from the group consisting of (1) a polyfunctional cyanic acid ester or its prepolymer, (2) a mixture of a polyfunctional cyanic acid ester or its prepolymer with a polyfunctional maleimide or its prepolymer and (3) a pre-copolymer of a polyfunctional cyanic acid ester and a polyfunctional maleimide,

(C) an amine-substituted triazine and/or a cyanoguanidine compound, and

(D) an inorganic filler other than glass, and/or an organic filler.

4,506,054

COATING COMPOSITION OF A SOLUTION FLUOROCARBON POLYMER, A DISPERSED FLUOROCARBON POLYMER AND A POLYAMINE CURING AGENT

Joseph A. Vasta, 1412 Jan Dr., Webster Farms, Wilmington, Del. 19803

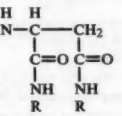
Continuation-in-part of Ser. No. 509,706, Jun. 30, 1983,. This application Mar. 21, 1984, Ser. No. 591,968
Int. Cl.³ C07C 102/06, 103/10, 103/87; C08K 3/10
U.S. Cl. 524—413 30 Claims

1. A coating composition comprising about 10–70% by weight binder and 30–90% by weight of a nonaqueous organic liquid; wherein the binder comprises:

a fluorocarbon polymer in solution comprising vinylidene fluoride and hexafluoropropylene having a weight average molecular weight of about 5,000–600,000;

dispersed fluorocsrbon polymer particles having a particle size of about 1–150 microns and being selected from the group consisting of polytetrafluoroethylene, fluorinated ethylene/propylene polymer, polyvinyl fluoride, polyvinylidene fluoride, copolymer of tetrafluoroethylene/perfluoroalkoxyvinylether;

a metallic oxide which is an acid acceptor; and a curing agent of the formula



where R is R^1NH_2 and R^1 is aliphatic or cycloaliphatic hydrocarbon radical.

4,506,055

CARBOXY MODIFIED VINYL ESTER URETHANE RESINS

William W. Bristowe, Wilmington, and Ernest C. Ford, Jr., Newark, both of Del., assignors to ICI Americas Inc., Wilmington, Del.

Filed Jun. 23, 1983, Ser. No. 506,910
Int. Cl.³ C08K 3/00
U.S. Cl. 525—424 9 Claims

1. A sheet molding composition comprising from 10–60 percent by weight of an ethylenically unsaturated monomer selected from the group consisting of styrene, chlorostyrene, t-butylstyrene, divinylbenzene, vinyltoluene, vinylacetate, vinylpropionate, acrylic acid, methacrylic acid esters and substituted acrylic acid esters, diallylphthalate, diallylfumarate, triallylcyanurate and trivinylisocyanurate, and a carboxy terminated vinyl ester urethane polymer having the general formula:

$$B—I[A—M—A—M]_n—CO_2H$$

wherein

B is a radical derived from a hydroxyl-terminated ester of acrylic or methacrylic acid;

I is a radical derived from an aromatic polyisocyanate;

A is a radical derived from a polyoxyalkylene bisphenol A or derivative thereof;

M is a radical derived from a dicarboxyli acid or anhydride thereof;

n is an integer equal to from 1 to about 10.

4,506,056

MALEIC ANHYDRIDE-MODIFIED POLYMERS AND PROCESS FOR PREPARATION THEREOF

Norman G. Gaylord, New Providence, N.J., assignor to Gaylord Research Institute Inc., New Providence, N.J.

Continuation-in-part of Ser. No. 385,753, Jun. 7, 1982, abandoned. This application Jun. 18, 1982, Ser. No. 389,825

Int. Cl.[3] **C08F** *255/00, 263/00, 259/04, 279/02*

U.S. Cl. 524—445 **69 Claims**

1. A process for preparing carboxyl-containing polymers with decreased crosslinking and/or degradation which comprises mixing together (1) maleic anhydride, (2) a free radical initiator, (3) an additive which inhibits the homopolymerization of maleic anhydride but not that of methyl methacrylate at below about 100° C., and (4) a polymer undergoing deformation in bulk or in the melt at a temperature where the free radical initiator has a half life of less than 3 hours and undergoes decomposition during the mixing, and where said polymer is obtained from at least one ethylenically unsaturated monomer selected from the group consisting of olefins, diolefins, unsaturated esters and vinyl chloride.

4,506,057

STABLE LATEXES CONTAINING PHOSPHORUS SURFACE GROUPS

Bettye W. Greene, and Sun-Lin Chen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 19, 1983, Ser. No. 562,886

Int. Cl.[3] **C08K** *5/50;* **C08L** *9/08*

U.S. Cl. 524—461 **20 Claims**

1. A modified latex composition containing a phosphorus surface group comprising:

(a) at least one ethylenically unsaturated synthetic monomer which is emulsion polymerized to form a latex, and

(b) a phosphorus compound which is intimately bound to the surface of said latex, said phosphorus compound being a phosphonate and/or a phosphate compound.

4,506,058

SELF-BONDING ROOM TEMPERATURE VULCANIZABLE SILICONE COMPOSITIONS

Bruce A. Ashby, Schenectady, and Gary M. Lucas, Scotia, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Mar. 14, 1984, Ser. No. 589,429

Int. Cl.[3] **C08K** *5/54*

U.S. Cl. 524—730 **25 Claims**

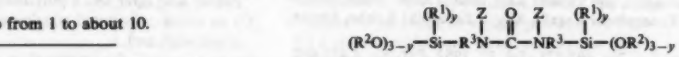
1. A composition which vulcanizes at room temperature on exposure to moisture comprising a product resulting from mixing:

(A) an organopolysiloxane consisting essentially of repeating units of the formula

where R is a $C_{(1-13)}$ monovalent substituted or unsubstituted hydrocarbon radical and where the viscosity of said organopolysiloxane is at least 100 centipoise at 25° C.

(B) an effective amount of condensation catalyst, and

(C) an effective amount of self-bonding agent of the general formula



where R^1 is a $C_{(1-7)}$ monovalent hydrocarbon radical, R^2 is a $C_{(1-4)}$ alkyl radical, $C_{(1-4)}$ acyl radical or a radical of the formula $-CH_2CH_2O)_nR^4$, where n is 1 or 2 and R^4 is a $C_{(1-4)}$ alkyl radical, R^3 is a $C_{(1-18)}$ divalent hydrocarbon radical free of aliphatic unsaturation attached to a nitrogen atom of the urea nucleus through a non-aromatic carbon atom, Z is hydrogen or a $C_{(1-4)}$ alkyl radical and y equals 0 or 1.

4,506,059

PROCESS FOR THE PREPARATION OF A MODIFIED HYDROCARBON RESIN

Kurt Hultzsch, and Albert Rudolphy, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 39,399, May 15, 1979, Pat. No. 4,401,791, which is a continuation-in-part of Ser. No. 702,204, Jul. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 428,855, Dec. 27, 1973, abandoned. This application Jul. 13, 1982, Ser. No. 397,886

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1972, 2264284

Int. Cl.[3] **C08L** *61/06*

U.S. Cl. 525—134 **6 Claims**

1. A process for the preparation of a modified hydrocarbon resin free from indene suitable for use as a binder in a printing ink from a hydrocarbon resin (I) relatively unsuitable for use as a binder in a printing ink and having a melting point of at most 110° C. which comprises reacting in a first step a starting reactant of:

(I) at least one hydrocarbon resin based on hydrocarbon fractions containing:

(aa) from 20 to 100 percent by weight, referred to the total of polymerizable monomers, of olefinically unsaturated monomers with on average 5 C-atoms or

(bb) a combination thereof with 15 to 50 percent by weight, referred to the total of polymerizable monomers, of methylcyclopentadiene or

(Ia) a combination of at least one of (Iaa) and (Ibb) with 1 to 20 percent by weight, referred to the total of I, of at least one olefinically unsaturated monomer hydrocarbon having 2 to 12 carbon atoms selected from the group consisting of styrene, α- and β-methylstyrene, vinyltoluenes and a mixture of olefinically unsaturated hydrocarbons having 2 to 12 carbon atoms, the total amount of monomers always being 100% by weight,

(Ib) a natural resinic acid in an amount effective for adjusting the viscosity of the end product, but in a proportion of more than zero and up to 20 percent by weight based on the weight of the hydrocarbon resin,

with

(II) 3 to 20% as much by weight of a dicarboxylic acid unit selected from the group consisting of

(IIa) an α-, β-olefinically unsaturated dicarboxylic acid and

(IIb) an equivalent amount of the corresponding dicarboxylic anhydride as defined in (IIa) to form a reaction product and in a second step reacting the reaction product

(III) 1 to 100% as much by weight of a phenol component selected from the group consisting of

(III) (a) an unsubstituted or substituted by up to 3 hydrocarbon groups phenol aldehyde resin in which, however, the phenol component is at least bi-functional and

(III) (b) a mixture of a phenol and an aldehyde being the same as the starting materials phenol and aldehyde of (III) (a);

the portion (I), (II), and (III) being correlated so that said modified hydrocarbon resin has a melting point of at least 120°

C. and a viscosity in 50% toluene solution at 20° C. of at least 100 centipoise.

4,506,060

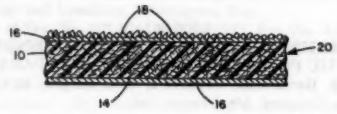
WATER SOLUBLE ONE-COMPONENT POLYMERIC RESIN BINDER SYSTEM FOR FIBERGLASS MATS

James T. White, Sr., Tuscaloosa, and Dan J. Kennedy, Northport, both of Ala., assignors to Reichhold Chemicals Incorporated, White Plains, N.Y.

Continuation of Ser. No. 160,436, Jun. 17, 1980, abandoned. This application Apr. 12, 1983, Ser. No. 484,249

Int. Cl.³ C08L 61/24

U.S. Cl. 525—163 2 Claims



1. A water soluble storage stable polymeric resin blend for use as a binder system for impregnating and coating a fiberglass mat formed from chopped strands of fiberglass to produce a flexible fiberglass shingle for application in the roofing industry, said storage stable polymeric resin blend consisting essentially of two ingredients (A) and (B) wherein (A) consists of from about 90 to about 25 precent by weight based upon the total weight of (A) and (B) used of a urea-formaldehyde resin herein said urea-formaldehyde resin has a molecular weight below 250 and is formed by reacting from about 1.1 to about 3.0 moles of formaldehyde per mole of urea in a conventional manner, and ingredient (B) being from about 10 to about 75 percent by weight based upon the total weight of (A) and (B) of a polymeric material selected from the group consisting essentially of polyvinyl acetate polymers and vinyl acrylic-vinyl acetate copolymers wherein said vinyl acrylic-vinyl acetate copolymers contain from about 1 to about 20 percent by weight butyl acrylate and from about 80 to about 99 percent by weight vinyl acetate and mixtures thereof, wherein said water soluble storage stable polymeric blend has a viscosity ranging from about 200 to about 700 cps, a pH ranging from about 6.5 to about 8.5 after 24 hours, and a non-volatile content ranging from about 45 to about 65 percent based upon the total weight of said polymeric resin blend.

4,506,061

PROCESS FOR PRODUCING OLEFIN COPOLYMER RUBBER

Kenya Makino; Hideo Sakurai, both of Kuwana; Toshiyuki Toyoda, Kameyama, and Yoshitaka Matsuo, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1982, Ser. No. 423,214

Claims priority, application Japan, Dec. 28, 1981, 56-209713

Int. Cl.³ C08F 4/64

U.S. Cl. 526—142 15 Claims

1. A process for producing an olefin copolymer rubber containing 25 to 75% by weight of propylene, which comprises polymerizing ethylene and propylene, or ethylene, propylene and at least one nonconjugated diene, at a temperature of 10° to 150° C., in solution in the presence of a catalyst, said catalyst comprising

(A) a Ti-containing solid component precipitated from a liquid product obtained by reacting a titanium tetrahalide with an organomagnesium compound in a halogenated hydrocarbon solvent in the presence of an ether of the formula R^1OR^2 wherein R^1 and R^2 are identical or different and each represents a hydrocarbon group having 2 to 12 carbon atoms, and

(B) an organoaluminum compound,

wherein the ratio of the catalyst component (A) to the catalyst component (B) is in the range of from 1:0.2 to 1:200 based on the atomic ratio of titanium to aluminum.

4,506,062

INVERSE SUSPENSION POLYMERIZATION PROCESS

Peter Flesher, and Adrian S. Allen, both of Bradford, England, assignors to Allied Colloids Limited, Bradford, England

Filed Aug. 2, 1983, Ser. No. 519,610

Claims priority, application United Kingdom, Aug. 9, 1982, 8222932

Int. Cl.³ C08F 2/32, 2/18

U.S. Cl. 526—211 9 Claims

1. A reverse phase suspension polymerisation process in which an aqueous solution of polymerisable material is dispersed as droplets in a water immiscible liquid containing a suspension polymerisation stabiliser and the polymerisable material is polymerised in the droplets to form a dispersion in the non-aqueous liquid of aqueous polymer droplets and in which the stabilizer is ionic or potentially ionic, the polymerisable material comprises polymerisable material that is ionic having a charge type opposite to that of the stabiliser; characterised in that the dispersion of the said aqueous solution of polymerisable material into the water immiscible liquid is conducted in the presence of a water soluble, substantially oil insoluble, non-polymerisable polar ionic organic compound, which is cationic or anionic having the same charge type as the polymerisable material and having at least one alkyl group containing at least 6 carbon atoms, said polar organic compound being added to the aqueous solution of polymerisable material prior to droplet formation, and said suspension stabiliser is a copolymer of hydrophilic and hydrophobic monomers.

4,506,063

ADVANCED EPOXY RESINS CONTAINING TRIAZINE OR BOTH TRIAZINE AND OXAZOLINE GROUPS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1984, Ser. No. 582,415

Int. Cl.³ C08G 59/00, 65/00

U.S. Cl. 528—96 20 Claims

1. Advanced epoxy resin compositions containing triazine groups or triazine and oxazoline groups which are prepared by a method which comprises reacting (A) (1) at least one hydroxyaromatic oligomer containing at least one triazine group or (2) at least one hydroxyaromatic oligomer containing at least one triazine group and at least one oxazoline group or (3) a mixture of (1) and (2) with (B) at least one material having an average of more than one 1,2-epoxy group per molecule and wherein the components are present in quantities which provide a ratio of phenolic hydroxyl groups to epoxy groups of from about 0.1:1 to about 1:1.

4,506,064

AMIDE AND CARBAMATE TERMINATED COPOLYESTER-CARBONATES

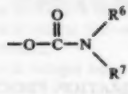
Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Nov. 10, 1983, Ser. No. 550,382

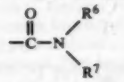
Int. Cl.³ C08G 63/64

U.S. Cl. 528—176 12 Claims

1. Aromatic copolyester-carbonate resins having from about 25 to about 90 mole percent ester bonds containing at least one terminal group selected from aliphatic carbamate terminal groups and aliphatic amide terminal groups, said aliphatic carbamate terminal groups being represented by the general formula



and said aliphatic amide terminal groups being represented by the general formula



wherein R^6 and R^7 are independently selected from hydrogen, alkyl radicals, and cycloalkyl radicals.

4,506,065

COPOLYESTERCARBONATES

Kenneth F. Miller, Mt. Vernon, and Edward L. Belfoure, New Harmony, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Jan. 3, 1984, Ser. No. 567,816
Int. Cl.³ C08G *63/64*
U.S. Cl. 528—194 **4 Claims**

1. A copolyestercarbonate composition comprising the reaction product of a dihydric phenol, a carbonate precursor and a mixture of isophthalic acid or isophthalic ester forming derivative and terephthalic acid or terephthalic acid ester forming derivative; the mole ratio of isophthalate to terephthalate in the copolyestercarbonate being about 0.5:9.5 to 2:8 and the ester content in the copolyestercarbonate varying from about 25 to 45 mole percent.

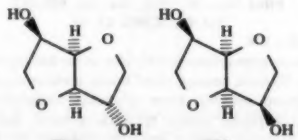
4,506,066

THERMOPLASTIC POLYCARBONATES, THEIR PREPARATION AND THEIR USE AS SHAPED ARTICLES AND FILMS

Harald Medem; Manfred Schreckenberg; Rolf Dhein; Werner Nouvertné, and Hans Rudolph, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

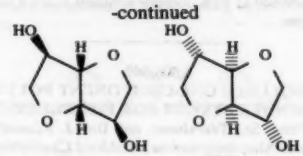
Continuation of Ser. No. 186,999, Sep. 15, 1980, abandoned. This application Apr. 13, 1983, Ser. No. 487,337
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938464
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—196 **15 Claims**

1. A high molecular thermoplastic copolycarbonate comprising the product of the reaction of (i) at least one bis-halogencarbonic acid ester of a diol selected from the group consisting of



(IIa) (IIb)

-continued



(IIc) (IId)

and (ii) at least one aromatic diphenol, said product of reaction characterized in that 5 to 50 mole percent of the copolycarbonate structural units conform to carbonates of said diol.

4,506,067

DETECTING STOICHIOMETRIC END POINT IN AROMATIC POLYCARBONATE RESIN PREPARATION

Michael J. Burzminski, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Oct. 5, 1983, Ser. No. 539,162
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—196 **14 Claims**

1. A method for detecting the stoichiometric end point of a preparation of aromatic polycarbonate resin from at least one dihydric phenol, phosgene and an organic solvent in which the phosgene is normally soluble in a reactor comprising a vapor phase portion which comprises detecting the increase of phosgene gas occurring in the vapor phase portion of the reactor at or shortly after achievement of the stoichiometric end point of the aromatic polycarbonate preparation.

4,506,068

TWO STAGE HIGH MOLECULAR WEIGHT POLYBENZIMIDAZOLE PRODUCTION WITH PHOSPHORUS CONTAINING CATALYST

Eui W. Choe, Randolph; Anthony B. Conciatori, Chatham, both of N.J., and Bennett C. Ward, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 477,093, Mar. 21, 1983,. This application Feb. 2, 1984, Ser. No. 576,328
Int. Cl.³ C08G *73/18*
U.S. Cl. 528—207 **2 Claims**

1. A two stage polymerization process for the production of high molecular weight polybenzimidazole from at least one monomeric aromatic reactant having a pair of amine substituents in an ortho position relative to each other and an aliphatic, alicyclic or aromatic carboxylate ester group positioned on an aromatic nucleus, which comprises heating the reactant above the melting temperature of the reactant in a first stage melt polymerization zone in contact with a phosphorus-containing polymerization catalyst selected from arylphosphines or arylphosphites to provide a foamed prepolymer; and heating the prepolymer in a second stage solid state polymerization zone at a temperature above about 250° C. to produce high molecular weight polybenzimidazole product.

4,506,069

LOW VULNERABILITY GUN PROPELLANT

Michael W. Barnes, Brigham; Clifford E. Kristofferson, North Ogden, both of Utah, and Anthony P. Manzara, Stillwater, Minn., assignors to Thiokol Corporation, Chicago, Ill.

Division of Ser. No. 484,001, Apr. 11, 1983, Pat. No. 4,456,493. This application Dec. 21, 1983, Ser. No. 564,972
Int. Cl.³ C08G *2/26*
U.S. Cl. 528—232 **8 Claims**

1. A polyisocyanate curable prepolymer comprising a polyalkynediol formal having a number average molecular weight greater than 1000.

7. A method of preparing the prepolymer of claim 1 comprising:

(a) reacting substantially equimolar amounts of formalde-

hyde and alkynediol while removing produced water until the reaction is substantially complete,

(b) adding to the product of step (a) an additional between about 5 and about 20% by weight of formaldehyde or a formaldehyde source based upon the weight of formaldehyde initially reacted, and

(c) reacting the additional formaldehyde while removing additionally produced water until the reaction is substantially complete.

4,506,070

ANTISTATIC COMPOSITION AND POLYESTER FIBER CONTAINING SAME

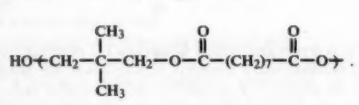
Victor R. Ben, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 401,626, Jul. 26, 1982, Pat. No. 4,468,433. This application Mar. 21, 1984, Ser. No. 591,846

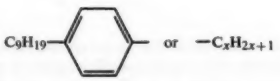
Int. Cl.³ C08G *63/68, 79/02*

U.S. Cl. 528—287 **3 Claims**

1. A polymer composition comprising at least about 75 mol percent polyester units having the formula

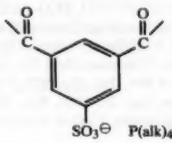


and between 5 and 25 mol percent capped polyether units having the formula —CH_2—CH_2—O—$_n$—R wherein n is 8 to 20 and R is



where x is 12 to 16, said polymer composition having an inherent viscosity in the range of 0.15 to 0.35.

2. The polymer composition of claim 1 which also contains between 0.2 and 2 mole percent tetra alkyl phosphonium sulfo isophthalate units having the formula



where (alk) is an alkyl group of 1 to 8 carbon atoms.

4,506,071

PROCESS FOR PREPARING MICROCRYSTALLINE ISOXICAM

Wolfgang Herrmann, Merzhausen, and Uwe Gebhardt, Waldkirch, both of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 12, 1984, Ser. No. 588,420

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311165

Int. Cl.³ C07D *413/12, 417/12*

U.S. Cl. 544—49 **3 Claims**

1. A process for the preparation of a microcrystalline form of isoxicam having a particle size of about 1–30 μm (90% between 2 and 25 μm) comprising dissolving isoxicam in a mixture consisting of a water-miscible solvent and an aqueous base where the resulting solution is at a pH of about 8–9; adding dilute acid to a pH value of 4–6 with vigorous agitation; separating the deposited precipitate separated from the mother liquor; washing with water and drying the product at 50°–60° C.

4,506,072

REGENERATION OF CAFFEINE-LOADED ACTIVATED CARBON WITH HOT WATER

Manfred Gehrig, Wolnzach; Manfred Barthels, and Hans Wienges, both of Bremen, all of Fed. Rep. of Germany, assignors to Hag GF Aktiengesellschaft, German Democratic Rep.

Filed Apr. 18, 1983, Ser. No. 485,766

Int. Cl.³ C07D *473/12*

U.S. Cl. 544—274 **3 Claims**

1. A process for recovering caffeine adsorbed to activated carbon with simultaneous regeneration of the activated carbon, characterized in that the caffeine-loaded activated carbon is treated with water at a pressure of at least 86 bar and at a temperature of at least 300° C.

4,506,073

CHROMENOAZAINDOLIZINE COMPOUNDS

Heinz Balli, Riehen; Sigmund Gunzenhauser, Arlesheim; Ian J. Fletcher, Magden, and Davor Bedekovic, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

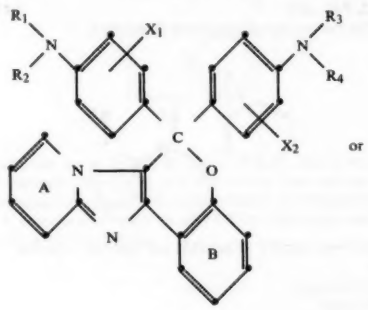
Filed Mar. 28, 1983, Ser. No. 479,292

Claims priority, application Switzerland, Apr. 6, 1982, 2124/82

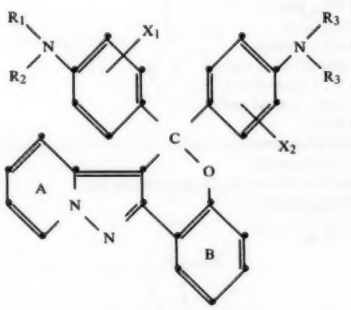
Int. Cl.³ C07D *471/22*

U.S. Cl. 546—64 **7 Claims**

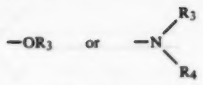
1. A chromenoazaindolizine of the formula



or



wherein each of X_1 and X_2 independently of the other is hydrogen, halogen, lower alkyl, lower alkanoylamino or a group of the formula



each of R_1, R_2, R_3 and R_4 independently of the other is hydrogen, C_1–C_{12} alkyl which is unsubstituted or substituted by halogen, hydroxy, cyano or lower alkoxy, or is C_5–C_6 cycloalkyl, phenyl, benzyl, or phenyl or benzyl each substituted by halogen, nitro, lower alkyl or lower alkoxy, or each pair of substituents (R_1 and R_2) and (R_3 and R_4) independently of the other, together with the nitrogen atom to which said pair is attached, is a 5- or 6-membered heterocyclic radical; and each of the rings A and B independently of the other is unsubstituted or substituted by halogen, nitro, lower alkyl, lower alkoxy, phenyl, phenoxy, or by an amino group which is unsubstituted or mono- or disubstituted by lower alkyl, phenyl, lower alkanoyl or benzyl.

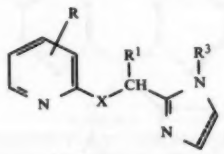
4,506,074

2-[2-PYRIDINYLOXY(THIO OR AMINO)METHYL]-1H-IMIDAZOLES AND DERIVATIVES

Joel R. Huff, Lederach; Walfred S. Saari, Lansdale, and John J. Baldwin, Gwynedd Valley, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 8, 1982, Ser. No. 439,697
Int. Cl.³ C07D *401/12*
U.S. Cl. 546—278 **3 Claims**

1. The compound of structural Formula I:



or a pharmaceutically acceptable salt thereof, wherein:

R is

(1) hydrogen;
(2) halo;
(3) C_{1-3} alkyl;
(4) hydroxy;
(5) C_{1-3} alkoxy;
(6) phenyl-C_{1-3} alkoxy;
(7) C_{3-5} alkenyloxy;
(8) di(C_{1-3} alkyl)amino;
(9) nitro;
(10) trifluoromethyl;
(11) sulfonamido;
(12) N,N-di(C_{1-3}alkyl)sulfonamido; and
(13) C_{2-5}alkanoyl;

X is

—S—, —SO, —SO_2, or —O—; and

R^1, R^2 and R^3 are independently hydrogen or C_{1-3} alkyl; and the dotted line is an optional double bond.

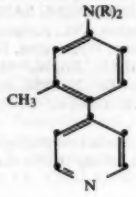
4,506,075

PROCESS OF PREPARING CARDIOTONIC 3-METHYL-4-(4-PYRIDINYL)BENZENEAMINES

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 347,086, Feb. 8, 1982, Pat. No. 4,415,578.
This application Apr. 14, 1983, Ser. No. 485,086
Int. Cl.³ C07D *213/73, 213/74*
U.S. Cl. 546—329 **3 Claims**

2. The process for preparing a compound having the formula:



where R is hydrogen which comprises (1) reacting pyridine, benzoyl chloride and a 3-methyl-N,N-di-lower-alkylbenzeneamine in the presence of copper powder in a molar ratio of said reactants of 1.5:1.5:1.0:0.03 and decomposing the reaction mixture with alkali and (2) heating the resulting 3-methyl-4-(4-pyridinyl)-N,N-di-lower-alkylbenzeneamine with hydrogen bromide and pyridine.

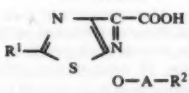
4,506,076

AMINO OR AMIDO-THIAZOLYL, SUBSTITUTED OXYIMINO DISUBSTITUTED ACETIC ACID

Takashi Kamiya, Suita; Kunihiko Tanaka, Toyonaka; Tsutomu Teraji, Osaka, and Yoshiharu Nakai, Ohtsu, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

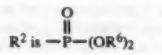
Division of Ser. No. 56,504, Jul. 11, 1979, Pat. No. 4,288,435.
This application Apr. 29, 1981, Ser. No. 258,661
Claims priority, application United Kingdom, Jul. 17, 1978, 30080/78
The portion of the term of this patent subsequent to Mar. 19, 2001, has been disclaimed.
Int. Cl.³ C07D *277/30*
U.S. Cl. 548—119 **4 Claims**

1. A compound of the formula:



wherein

R^1 is amino or a protected amino group,



R^6 is hydrogen or C_1–C_6 alkyl, and

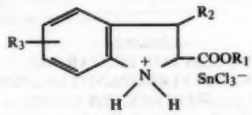
A is methylene or ethylene, or a salt thereof.

4,506,077
TIN COMPLEXES OF INDOLINE-2-CARBOXYLIC ACIDS AND ESTERS PREPARED FROM O-NITROPHENYLPYRUVIC ACIDS AND ESTERS

Ronald J. McCaully, Malvern, and Dong H. Kim, Wayne, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 3, 1983, Ser. No. 463,428
Int. Cl.³ C07D *209/18*
U.S. Cl. 548—402 4 Claims

1. A process for the preparation of indoline-2-carboxylic acid ester tin complex of the formula:



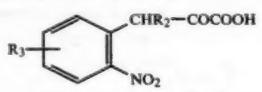
I

wherein

R^1 is a lower alkyl group;

R^2 is hydrogen or a lower alkyl group; and

R^3 is hydrogen, a lower alkyl group, a lower alkoxy group, or a halogen, which comprises contacting an o-nitrophenylpyruvic acid or ester of the formula:



II

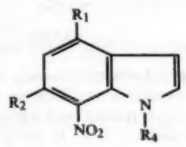
wherein R_2 and R_3 are as defined above, with metallic tin and dry hydrogen chloride in a lower alkanol of the formula R_1OH, wherein R_1 is as defined above, at atmospheric pressures.

4,506,078
7-NITROINDOLES

Andrew D. Batcho, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 5, 1981, Ser. No. 270,718
Int. Cl.³ C07D *209/08*
U.S. Cl. 548—469 2 Claims

1. A compound of the formula



VII

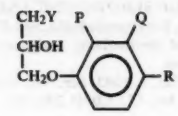
wherein at least one of R_1 and R_2 is halogen and the other is halogen or hydrogen, and R_4 is hydrogen.

4,506,079
PROCESS FOR PREPARING INDOLES

Makiko Sakai, Kanagawa, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

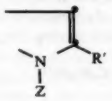
Filed Mar. 5, 1980, Ser. No. 127,521
Claims priority, application Japan, Mar. 7, 1979, 54-27010; Jan. 30, 1980, 55-10399
Int. Cl.³ C07D *209/04*
U.S. Cl. 548—503 10 Claims

1. A process for preparing a compound of the formula



wherein

one of P and R combined with Q represents

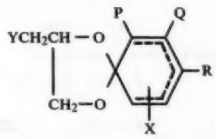


in which R′ is hydrogen or lower alkyl, and

Z is hydrogen, lower alkanoyl, lower alkyl sulfonyl, C_6-C_{10} aroyl or C_6-C_{10} arylsulfonyl, and

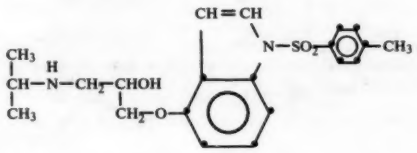
the remaining P or R is hydrogen or halogen, and Y is halogen, hydroxy, C_6-C_{10} arylsulfonyloxy, amino, lower alkylamino, C_6-C_{10} aryl lower alkylamino, lower acyl amino wherein the acyl group is from a carboxylic, sulfonic, sulfenic, phosphoric or carbonic acid, di-lower alkylamino, lower alkyleneamino, N-lower alkyl-N-C_6-C_{10} aryl lower alkylamino, di-lower acylamino wherein the acyl group is from a carboxylic, sulfonic, sulfenic, phosphoric or carbonic acid, N-lower alkyl-N-lower acylamino wherein the acyl group is from a carboxylic, sulfonic, sulfenic, phosphoric or carbonic acid, or N-tri-lower alkylsilylamino,

which comprises subjecting a compound of the formula

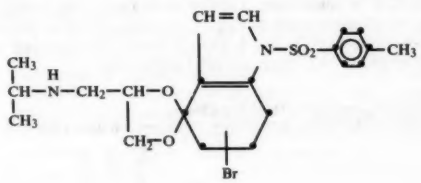


wherein Y, P, Q and R are as defined above and X is hydrogen or halogen, and the dotted line represents the presence of one or two double bonds to aromatization.

2. A process according to claim 1 for the preparation of a compound of the formula



which comprises subjecting a compound of the formula



to aromatization.

4,506,080

PREPARATION OF SEROTONINE AND DERIVATIVES

Raymond Bertholet, La Tour-de-Peilz, and Pierre Hirsbrunner, Corseaux, both of Switzerland, assignors to Nestec S. A., Vevey, Switzerland

Filed Jul. 1, 1983, Ser. No. 510,167

Int. Cl.³ C07D *209/16*

U.S. Cl. 548—504 **6 Claims**

1. A process for the separation of serotonine from coffee wax wherein a solution of coffee wax is subjected to alkaline hydrolysis using a strong base in the presence of water in an inert atmosphere after which the reaction medium containing the serotonine is recovered characterised in that the solvent for the coffee wax is a compound having the general formula II:

$$R—(OC_2H_4)_x—O—C_nH_{2n}OH \qquad II$$

wherein R is hydrogen or an alkyl group containing from 1 to 4 carbon atoms, x is 0 or 1 and n is an integer from 2 to 4 with the proviso that x cannot have a value of 1 when n is 3 or 4.

4,506,081

POLYMERIC QUATERNARY AMMONIUM COMPOUNDS AND THEIR USES

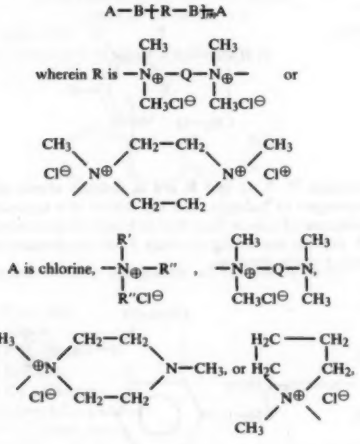
Joseph G. Fenyes, Germantown, and John D. Pera, Memphis, both of Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Sep. 2, 1982, Ser. No. 414,108

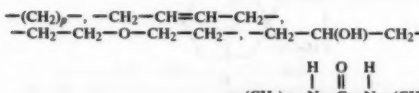
Int. Cl.³ C07C *127/15*; C07D *207/04*; A01N *47/28, 43/36*

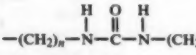
U.S. Cl. 548—523 **11 Claims**

1. The polyquaternary ammonium compositions having the structure

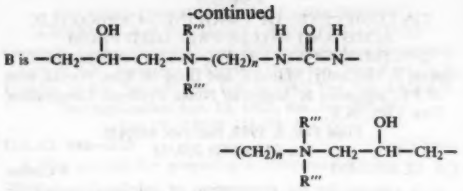


R′ is methyl, ethyl, propyl, hydroxyethyl or hydroxypropyl; characterized in that R′ and R″ are identical when R′ is an ethyl, propyl, hydroxyethyl or hydroxypropyl and when R′ is methyl, R″ is independently methyl or an alkyl group containing 5 to 22 carbon atoms having 0 to 2 carbon to carbon double bonds, cyclohexyl, benzyl or phenyl; further characterized in that R′ and R″ may form a pyridyl group; Q is





-continued



R‴ is a lower alkyl group, m is 0 or a number from 1 to 200, n is 2 or 3, and p varies from 2 to 12.

4,506,082

PROCESS FOR PREPARING 1-(3-BROMO-2-ALKYLPROPANOYL)-L-PROLINE DERIVATIVES

Roger Crossley, Reading, United Kingdom, assignor to John Wyeth & Brother Limited, Maidenhead, United Kingdom

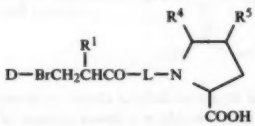
Division of Ser. No. 236,350, Feb. 20, 1981, Pat. No. 4,349,480. This application May 10, 1982, Ser. No. 376,355

Claims priority, application United Kingdom, Feb. 26, 1980, 8006414

Int. Cl.³ C07D *207/16*

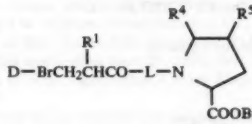
U.S. Cl. 548—533 **6 Claims**

1. A process for preparing a compound of formula VII



(VII)

in at least a 3:2 excess over the corresponding L,L-diastereoisomer wherein R^1 is lower alkyl, R^4 and R^5 either both represent hydrogen or together with the carbon atoms to which they are attached represent a fused benzene ring optionally substituted by a group selected from hydroxy, lower alkyl, lower alkoxy, and halogen characterised in that a mixture of a compound of formula (X)



(X)

and the corresponding L,L-diastereoisomer, in which the quantity of the D,L-diastereoisomer exceeds the L,L-diastereoisomer by at least 3:2, is reacted with trifluoroacetic acid at a temperature from about −5° C. to about 15° C. for a period of time less than about 25 minutes.

4,506,083

THIOXANTHONECARBOXYLIC ACID ESTERS, THIOESTERS AND AMIDES

Vratislav Kvita, Muttenz; Hans Zweifel, Basel; Martin Roth, Marly, and Louis Felder, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

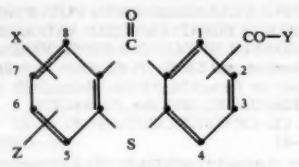
Continuation of Ser. No. 150,391, May 16, 1980, abandoned. This application Jun. 28, 1982, Ser. No. 392,922

Claims priority, application Switzerland, May 18, 1979, 4671/79

Int. Cl.³ C07D *335/16*

U.S. Cl. 549—27 **5 Claims**

1. A compound of the formula I



(I)

in which X is hydrogen, Z is bonded in the 7-position and is hydrogen, or alkyl having 1–4 C atoms, Y is $—OR_1$, R_1 is alkyl having 1–18 atoms, cyclohexyl or $—(CH_2CH_2O)_n—CH_3$, and n is an integer from 2 to 10, the group —CO—Y being bonded in the 1-position or 3-position.

4,506,084

AMINONITRILE INTERMEDIATES

Ian T. Kay, Wokingham, and Robert A. Noon, London, both of England, assignors to Imperial Chemical Industries PLC, London, England

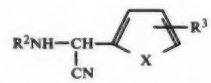
Division of Ser. No. 356,801, Mar. 10, 1982, Pat. No. 4,432,784. This application Nov. 28, 1983, Ser. No. 555,541

Claims priority, application United Kingdom, Mar. 19, 1981, 8108676

Int. Cl.³ C07D *307/52, 333/24*

U.S. Cl. 549—74 **1 Claim**

1. A compound of the formula



(III)

where R^2 is alkenyl of 3 to 5 carbon atoms either unsubstituted or substituted with C_1–C_4 alkoxy, C_1–C_4 alkylthio, or halogen, X is oxygen or sulphur, and R^3 is hydrogen, C_{1-4} alkyl or halogen.

4,506,085

β-AMINOACID DERIVATIVES AND PROCESS FOR PRODUCTION THEREOF

Yasuji Yamada, Hachioji, Japan, assignor to Sanraku-Ocean Co., Ltd., Tokyo, Japan

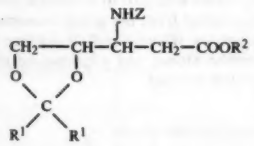
Filed Mar. 5, 1984, Ser. No. 586,143

Claims priority, application Japan, Mar. 9, 1983, 58-37252

Int. Cl.³ C07D *317/00*

U.S. Cl. 549—451 **4 Claims**

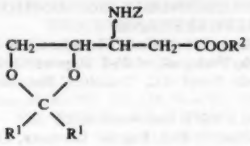
1. A compound represented by the formula



(I)

wherein R^1 represents a lower alkyl group, a phenyl group or a benzyl group, or the two R^1 groups together represent a group of the formula $—CH_2—_n$ in which n is an integer of 4 to 7; R^2 represents a hydrogen atom, an alkyl group, or a substituted or unsubstituted aralkyl group; and Z represents a hydrogen atom, a lower alkyl group or a substituted or unsubstituted benzyl group.

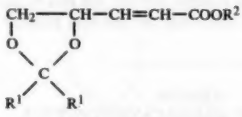
4. A process for producing a compound represented by the formula



(I)

wherein R^1 represents a lower alkyl group, a phenyl group or a benzyl group, or the two R^1 groups together represent a group of the formula $—CH_2—_n$ in which n is an integer of 4 to 7; R^2 represents a hydrogen atom, an alkyl group, or a substituted or unsubstituted aralkyl group; and Z represents a hydrogen atom, a lower alkyl group or a substituted or unsubstituted benzyl group,

which comprises subjecting a compound represented by the following formula



(II)

wherein R^1 and R^2 are as defined above,

and an amine represented by the following formula

ZNH_2 (III)

wherein Z is as defined above,

to the Michael's addition reaction.

4,506,086

PROCESS FOR THE PRODUCTION OF DIANHYDROHEXITOL MIXTURES AND LIQUID MIXTURE OF DIANHYDROHEXITOLS

Herbert Salzburg; Manfred Hajek, both of Cologne, and Holger Meyborg, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 20, 1983, Ser. No. 515,411

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1982, 3229412

Int. Cl.³ C07D *493/04*

U.S. Cl. 549—464 **9 Claims**

1. A process for the production of liquid 1,4-3,6-dianhydrohexitol isomer mixtures having a minimal tendency to crystallize comprising:

(a) dehydrating and isomerizing a diacylation product of (i) a hexitol and (ii) a compound selected from the group consisting of organic carboxylic acids, carboxylic acid anhydrides, carboxylic acid halides, ketene, carbonic acid ester derivatives and mixtures thereof at a temperature of at least 130° C. in the presence of a strong acid to form a diacylated dianhydro-hexitol isomer mixture; and

(b) converting the isomer mixture produced in (a) into a dianhydrohexitol isomer mixture.

4,506,087

METHOD FOR THE CONTINUOUS PREPARATION OF ALKOXYSILANES

Peter Fischer, Rheinfelden; Reiner Groh, Steyerbert, and Hans-Joachim Vahlensieck, Wehr, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Oct. 3, 1983, Se.. No. 538,589

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1982, 3236628

Int. Cl.³ C07F 7/08, 7/18

U.S. Cl. 556—471 12 Claims

1. A method for the continuous preparation of monomeric or oligomeric alkoxysilanes comprising: introducing a chlorosilane in liquid form into a reactor; introducing in a gaseous phase at least a stoichiometric amount of alcohol into the lower part of a mass transfer apparatus and condensing the off stream of alcohol for introduction into the reactor; reacting the chlorosilane and alcohol in the reactor to form a reaction mixture; removing the formed hydrogen chloride from the reactor; introducing the reaction mixture into the top end of the mass transfer apparatus; and removing the reaction product from the apparatus.

4,506,088

SUBSTITUTED AMINO CARBOXYETHYL HALOACETAMIDE HERBICIDE ANTIDOTES

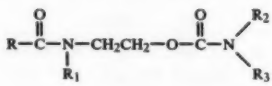
Hsiao-Ling M. Chin, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 220,925, Dec. 29, 1980, Pat. No. 4,400,203. This application Apr. 25, 1983, Ser. No. 488,291

Int. Cl.³ C07C 143/83

U.S. Cl. 560—12 4 Claims

1. A compound of the formula:



in which

R is halomethyl wherein halo refers to chlorine, bromine or iodine and the methyl group is mono- or di-substituted;

R_1 is selected from the group consisting of alkyl having 1–4 carbon atoms, inclusive; and phenyl;

R_2 is selected from the group consisting of hydrogen and methyl; and,

R_3 is selected from the group consisting of p-toluenesulfonyl and p-chlorophenylsulfonyl.

4,506,089

PREPARATION OF METHYL M-NITROBENZOATE

Alfred Hackenberger, Ludwigshafen; Manfred Patsch, Wachenheim, and Manfred Gaeng, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 586,668

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308460

Int. Cl.³ C07C 76/06, 79/46

U.S. Cl. 560—020 12 Claims

1. A process for the preparation of methyl m-nitrobenzoate from a mixture of methyl m-, p- and o-nitrobenzoate, wherein the isomer mixture is treated with from 10 to 1000% by weight of water in the presence of from 0.05 to 20% by weight of an emulsifier, the percentages being based on the weight of the isomer mixture,

(a) in a first stage at from 55° to 100° C. and a pH from 2 to 8 and then p1 (b) in a second stage at from 10° to 40° C. and a pH of not less than 9.

4,506,090

AROMATIC POLYOLS MADE FROM POLYETHYLENE TEREPHTHALATE SCRAP, GLYCOLS AND AROMATIC CARBONYL-CONTAINING COMPOUNDS

Michael E. Brennan, and George P. Speranza, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 15, 1983, Ser. No. 514,079

Int. Cl.³ C07C 69/08, 69/76, 69/80, 69/82

U.S. Cl. 560—91 10 Claims

1. A mixture of aromatic polyols having hydroxyl and ester functionalities for use in preparing polyurethane foams, being produced by the process comprising

a. reacting an aromatic carbonyl-containing compound selected from the group consisting of aromatic dicarboxylic acids, aromatic esters and aromatic anhydrides, with an alkylene glycol, in the absence of a catalyst, to form a precondensate and

b. transesterifying recycled polyethylene terephthalate with the precondensate at a temperature between 200° and 250° C. in the absence of a catalyst

where the mole ratios of aromatic carbonyl-containing compound to alkylene glycol to recycled polyethylene terephthalate fall within the range of about 1.0:2.0–5.0:1.0, respectively, and the resultant mixture of aromatic polyols has an average hydroxyl number of between 100 and 400.

4,506,091

REMOVAL OF CATALYST RESIDUES FROM POLYESTERS

Donald L. Deardorff, 43 Gould Pl., East Greenwich, R.I. 02818

Continuation-in-part of Ser. No. 318,847, Nov. 6, 1981, abandoned. This application Sep. 1, 1983, Ser. No. 528,411

Int. Cl.³ C07C 67/48, 67/08

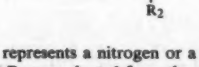
U.S. Cl. 560—99 7 Claims

1. In a process of preparing a refined liquid ester which comprises:

(a) reacting one or more mono- or di-carboxylic acid or anhydride with an excess of alcohol in the presence of a catalytically effective amount of an organotitanate catalyst,

(b) removing the water of esterification until esterification is essentially complete,

(c) that improvement which comprises contacting the unrefined ester residue product with 0.01 to 4.0 weight percent of a treating agent selected from the group consisting of tri(alkylphenyl)phosphites, wherein said alkyl group contains one to ten carbon atoms, and a compound represented by the structural formula:



wherein X represents a nitrogen or a phosphorous atom and R_1 and R_2 are selected from the group consisting of hydrogen, $—CH_2CH_2OH$, and an alkyl group containing from 1 to 10 carbon atoms,

(d) forming insolubles containing catalyst residues by steam distillation, and

(e) filtering a purified ester product from the resulting hydrolyzed titanium catalyst residues.

4,506,092

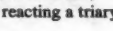
CARBONYLATION PROCESS FOR THE PRODUCTION OF AROMATIC ACIDS AND DERIVATIVES THEREOF

Carl M. Lentz, Mt. Carmel; James R. Overton, and David D. Cornell, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 6, 1984, Ser. No. 628,352
Int. Cl.[3] C07C *69/76*
U.S. Cl. 560—103 15 Claims

1. A process for the preparation of compounds of the formula

wherein R represents H or an aliphatic moiety having up to about 12 carbon atoms and R′ represents an aliphatic moiety having up to about 12 carbon atoms,
said process comprising reacting a triaryl sulfonium salt of the formula



wherein Ar represents a carbocyclic or heterocyclic aromatic moiety having about 5 to about 20 atoms in the ring or rings thereof, and X represents a weak acid anion,
with (i) carbon monoxide and (ii) water or an aliphatic alcohol or primary amine having up to about 12 carbon atoms in the presence of a catalyst system comprising (i) a zero-valent metal catalyst selected from the group consisting of palladium, rhodium, and mixtures thereof, and (ii) a triaryl phosphine.

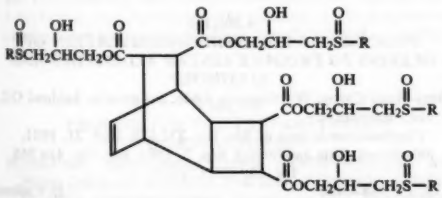
4,506,093

3-SULFOXY-1,2-PROPYLENE GLYCOLS-1-ESTERS OF TRICYCLO (4.2.2.0[2,5]) DEC-9-ENE-3,4,7,8-TETRACARBOXYLIC ACID

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 18, 1983, Ser. No. 485,670
Int. Cl.[3] C07C *147/02, 147/06*
U.S. Cl. 560—117 3 Claims

1. A 3-sulfoxy-1,2-propylene glycols-1-ester of the structural formula:



wherein R is selected from the group consisting of phenyl, biphenyl, naphthyl, anthracenyl, phenanthrenyl; alkyl of 1 to 22 carbon atoms; phenylalkyl, biphenylalkyl, alkylphenyl, alkylbiphenyl and cyclohexyl of 6 to 40 carbon atoms wherein R can be substituted with nitro, halogen, cyano and carboalkoxy moieties of 1 to 12 carbon atoms.

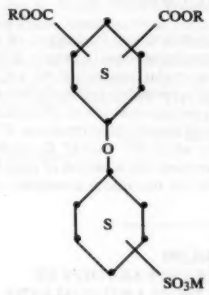
4,506,094

CYCLOALKYLSULFONATES, POLYMERS AND PROCESSES RELATING TO SAME

Susan E. Hartman; Michael E. Allen, and William E. Pascoe, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 324,238, Nov. 23, 1981, Pat. No. 4,433,130. This application Mar. 2, 1983, Ser. No. 471,385
Int. Cl.[3] C07C *143/20*
U.S. Cl. 560—118 6 Claims

1. A composition of matter having the formula:



wherein:
R is alkyl containing from 1 to 10 carbon atoms; and
M is a monovalent cation selected from the group consisting of alkali metal and ammonium.

4,506,095

PRODUCTION OF LINEAR ALKENOIC ACIDS AND ESTERS

Gerald S. Koermer, Springfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 17, 1983, Ser. No. 476,450
Int. Cl.[3] C07C *67/347, 57/10*
U.S. Cl. 560—205 4 Claims

1. A process for producing alkyl 5-hexenoate which comprises reacting propylene with alkyl acrylate in an inert solvent medium containing ingredients consisting essentially of a polymerization inhibitor and an alkylaluminum dichloride catalyst, at a temperature between about 25°–250° C. and a pressure between about 15–2000 psi.

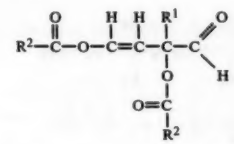
4,506,096

2-ALKYL-2,4-DIACYLOXY-BUT-3-ENALS

Hans-Martin Weitz, Bad Durkheim; Rolf Fischer, Heidelberg, and Joachim Paust, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 10, 1983, Ser. No. 473,773
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210707
Int. Cl.[3] C07C *69/007, 69/16, 69/28, 69/78*
U.S. Cl. 560—262 3 Claims

1. A 2-alkyl-2,4-diacyloxy-but-3-enal of the formula



I

where R^1 is alkyl of 1 to 5 carbon atoms and R^2 is hydrogen,

alkyl of 1 to 15 carbon atoms, a cycloaliphatic radical of 5 to 7 carbon atoms, phenyl or phenyl substituted by alkyl or halogen.

4,506,097

METHOD FOR THE RACEMIZATION OF (2)-2-(4-DIFLUOROMETHOXYPHENYL)-3-METHYL-BUTYRIC ACID

Venkataraman Kameswaran, Princeton Junction, N.J., assignor to American Cyanamid Co., Stamford, Conn.

Filed Apr. 25, 1983, Ser. No. 488,476

Int. Cl.³ C07B *20/00*

U.S. Cl. 562—401 **4 Claims**

1. A method for the racemization and hydrolysis of alkyl esters of (−)-2-(4-difluoromethoxyphenyl)-3-methylbutyric acid comprising: reacting one molar equivalent of a C_1–C_3 alkyl ester of (−)-2-(4-difluoromethoxyphenyl)-3-methylbutyric acid with one to two molar equivalents of sodium or potassium hydroxide in the presence of anhydrous C_1–C_3 alcohol at a temperature from about 60° to 100° C. or at the boiling point of the alcohol selected; for a period of time from about two to ten hours or until the reaction is essentially complete.

4,506,098

PROCESS FOR THE PREPARATION OF 2,6-DIALKYLANILINE FROM 1-NITROALKENE

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 6, 1981, Ser. No. 280,426

Int. Cl.³ C07C *87/50*

U.S. Cl. 564—305 **15 Claims**

1. A process for the preparation of 2,6-dialkylaniline wherein each alkyl group contains 1–4 carbon atoms which comprises the steps of:

(a) contacting a 1-nitroalkene having 3–6 carbon atoms with a 1,3-alkadiene having 5–8 carbon atoms at a temperature of from about 40° C. to about 200° C. and at a pressure of from about 0 psig to about 1000 psig to form a 3,5-dialkyl-4-nitro-cyclohexene adduct;

(b) contacting said adduct with hydrogen at a temperature of from about 0° C. to about 200° C. and at a pressure of from about 0 psig to about 1500 psig in the presence of a hydrogenation catalyst to form a 2,6-dialkylcyclohexyl amine; and

(c) contacting said amine with aqueous ammonia at a temperature of from about 200° C. to about 300° C. and at a pressure of from about 500 psig to about 1500 psig in the presence of a dehydrogenation catalyst.

4,506,099

PROCESS FOR PRODUCING SUBSTITUTED 1,11-DIAMINOUNDECANES

Peter Baumeister, Fluh; Dieter Reinehr, Kandern, and Eckehard Rosenegger, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

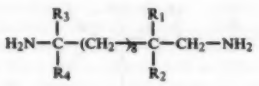
Filed Sep. 30, 1982, Ser. No. 430,641

Claims priority, application Switzerland, Oct. 12, 1981, 6507/81

Int. Cl.³ C07C *85/00, 85/20*

U.S. Cl. 564—413 **12 Claims**

1. A process for producing a compound of the formula I



(I)

wherein

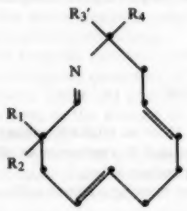
R_1 is C_{1-12}-alkyl,

R_2 is hydrogen or C_{1-12}-alkyl,

R_3 is C_{1-12}-alkyl, cycloalkyl having 4–12 ring C atoms, or unsubstituted or substituted phenyl, or piperidyl, tetrahydrofuryl or tetrahydrothienyl,

R_4 is hydrogen, C_{1-12}-alkyl, cycloalkyl having 4–12 ring C atoms, or unsubstituted or substituted phenyl, or

R_1 and R_2 and/or R_3 and R_4 together are alkylene having 3–11 C atoms, or $—CH_2—C(CH_3)_2—NH—C(CH_3)_2—CH_2—$, which comprises reacting a compound of the formula II



(II)

wherein R_1, R_2 and R_4 have the meanings defined under the formula I, and R_3' is C_{1-12}-alkyl, cycloalkyl having 4–12 ring C atoms, or unsubstituted or substituted phenyl, or pyridyl, furyl or thienyl, or together with R_4 it is alkylene having 3–11 C atoms, or $—CH_2—C(CH_3)_2—NH—C(CH_3)_2—CH_2—$, with ammonia and hydrogen, in the presence of a hydrogenation catalyst, to obtain a compound of the formula I.

4,506,100

AROMATIC DIAMINES

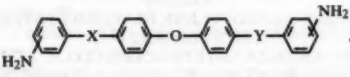
Jules E. Schoenberg, Scotch Plains, N.J., and Stephen P. Anderson, South Gate, Calif., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 292,257, Aug. 12, 1981, Pat. No. 4,405,770. This application Aug. 4, 1982, Ser. No. 405,218

Int. Cl.³ C07C *87/50, 85/11*

U.S. Cl. 564—430 **11 Claims**

1. A primary aromatic diamine having the general formula:



wherein X and Y are carbonyl or carbinol groups with the proviso that both X and Y can not be carbonyl groups; wherein the nitrogen may be independently attached to the benzene rings in the 2-, 3-, or 4-positions; and wherein isomerism is present when X, Y, or X and Y are said carbinol groups.

4,506,101

PROCESS FOR THE HYDROFORMYLATION OF OLEFINS TO PRODUCE LINEAR ALDEHYDES AND ALCOHOLS

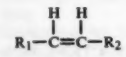
Biau-Hung Chang, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 332,558, Dec. 21, 1981, abandoned. This application Sep. 2, 1982, Ser. No. 414,565

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **25 Claims**

1. The method of forming linear aldehydes by reacting an olefin having at least three carbon atoms with carbon monoxide and a hydrogen source in the presence of a preformed catalyst at from about 100° to about 200° C. at a pressure of from about 500 psi to about 2500 psi and from between 0.5 to about 10 hours wherein said olefin has the following general formula:



wherein R_1 is selected from the group consisting essentially of alkyl, substituted alkyl, aryl and substituted aryl, R_2 is selected from the group consisting essentially of hydrogen, alkyl, substituted alkyl, aryl and substituted aryl, and either R_1 or R_2 represents hydrogen or C_1–C_9 alkyl;

wherein said preformed catalyst has the following general formula:

$$M^{+n}[H_yA_xL_z]^{-n}$$

wherein

A represents a metal selected from the group consisting essentially of Fe, Ru and Os;

n represents an integer greater than or equal to 2 if A is Ru or Fe and n represents an integer greater than or equal to 1 if A represents Os;

M represents a cationic moiety;

y represents an integer greater than or equal to 0;

x represents an integer greater than or equal to 1;

L is a ligand; and

z is an integer less than or equal to the available coordination bonding sites of A.

4,506,102

2-METHOXYETHYL CYCLODODECENYL ETHER AND PROCESSES FOR ITS PREPARATION AND CONVERSION TO 2-METHOXYETHYL CYCLODODECYL ETHER

Manfred Kaufhold, Marl, Fed. Rep. of Germany, and Hendrik J. Takken, HN Huizen, Netherlands, assignors to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany and Naarden International N.V., Naarden, Netherlands

Filed May 27, 1983, Ser. No. 498,628

Claims priority, application Fed. Rep. of Germany, May 27, 1982, 3219915

Int. Cl.³ C07C *41/01, 43/184, 43/188*

U.S. Cl. 568—667 **18 Claims**

1. 2-Methoxyethyl cyclododec-1-enyl ether.

5. A process for preparing 2-methoxyethyl cyclododec-1-enyl ether, comprising the step of reacting cyclododecanone, 2-methoxyethanol and a tri(lower alkyl)orthoformate, at a temperature of 50°–250° C., in the presence of an acid catalyst, removing resultant low-boiling compounds by distillation, and recovering resultant 2-methoxyethyl cyclododec-1-enyl ether.

15. A process for preparing 2-methoxyethyl cyclododecyl ether, comprising the steps of: (a) reacting cyclododecanone, 2-methoxyethanol and a tri(lower alkyl)orthoformate, at a temperature of 50°–250° C., in the presence of an acid catalyst, removing resultant low-boiling compounds by distillation, and recovering resultant 2-methoxyethyl cyclododec-1-enyl ether; and (b) contacting said resultant 2-methoxyethyl cyclododec-1-enyl ether with hydrogen in the presence of a hydrogenation catalyst, and recovering resultant 2-methoxyethyl cyclododecyl ether.

4,506,103

PROCESS FOR THE PREPARATION OF O-BENZYLPHENOL

Heinz-Peter Hemmerich; Werner Schulte-Huermann, and Heinz Dohm, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 6, 1983, Ser. No. 529,793

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3234036

Int. Cl.³ C07C *39/14*

U.S. Cl. 568—744 **19 Claims**

1. In a process for the preparation of o-benzylphenol by reacting phenol with dibenzyl ether in the presence of a condensation agent at a temperature of 100° to 300° C., the improvement wherein γ-aluminum oxide is employed as the condensation agent.

4,506,104

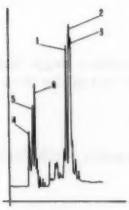
METHYL SUBSTITUTED PINYL OXOPENTENES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Bricktown; Robin K. Wolff, Point Pleasant; Richard M. Boden, Ocean, and Takao Yoshida, West Long Branch, all of N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

Division of Ser. No. 496,651, May 20, 1983, , said Ser. No. 396,485, is a continuation-in-part of Ser. No. 362,237, Mar. 26, 1982, Pat. No. 4,428,387. This application Feb. 23, 1984, Ser. No. 582,795

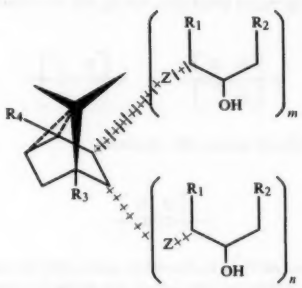
Int. Cl.³ C07C *35/22*

U.S. Cl. 568—820 **4 Claims**

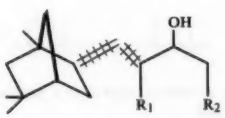


GLC PROFILE FOR EXAMPLE II.

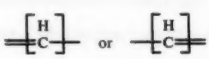
1. A compound defined according to the generic structure:



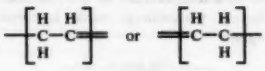
or the generic structure:



wherein Z represents methylidene defined according to the structure:



or ethylidene defined according to the structure:



or ethylenyl defined according to the structure:

wherein one of the dashed lines represents a carbon-carbon single bond and the other of the dashed lines represents no bond; wherein n is 0 or 1 and m is 0 or 1 with the sum of n+m being equal to 1; wherein R_1, R_2, R_3 and R_4 represent hydrogen or methyl; wherein one of the lines:

++++

represents a carbon-carbon single bond and the other of the lines:

++++

represents a carbon-carbon single bond or a carbon-carbon double bond; wherein one of the lines:

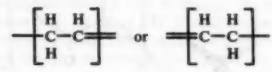
/+/+/+/+/+/

represents a carbon-carbon single bond and the other of the lines:

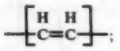
/+/+/+/+/

represents a carbon-carbon single bond or a carbon-carbon double bond; with the provisos that:

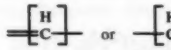
(i) when R_3 and R_4 are each hydrogen, the dashed line at the 7–5 position is a carbon-carbon single bond; n=0 and m is 1; Z represents ethylidene having the structure:



or ethylenyl having the structure:



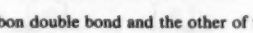
(ii) when one of R_3 or R_4 is methyl, then either the dashed line at the 7–5 position or the dashed line at the 7–4 position is a carbon-carbon single bond; and Z represents methylidene defined according to the structure:



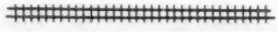
(iii) when R_3 is methyl, then n is 1 and m is 0 and R_4 is hydrogen; and

(iv) when R_4 is methyl, then R_3 is hydrogen, n is 0 and m is 1

and wherein one of the lines:



is a carbon-carbon double bond and the other of the lines:



is a carbon-carbon single bond.

4,506,105

PROCESS FOR PREPARING CYCLOOCTENE-4-OL-1 FROM CYCLOOCTADIENE-1,5

Manfred Kaufhold, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 303,584, Sep. 18, 1981,. This application Aug. 4, 1983, Ser. No. 519,895

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3037093

Int. Cl.³ C07C *35/20, 27/02*

U.S. Cl. 568—821 **16 Claims**

1. A process for preparing cyclooctene-4-ol-1 consisting essentially of:

(a) reacting cyclooctadiene-1,5 with formic acid in a ratio of 1:1.5 to 1:6 to form cyclooctenyl formate at a temperature of about 50° to 200° C. for a period of 3 to 20 hours;

(b) separating said cyclooctenyl formate by distillation into a plurality of fractions including a first fraction having an oil phase containing cyclooctadiene-1,5 and a formic acid phase, a second fraction containing any unidentified products generated by the addition of formic acid to cyclooctadiene-1,5 and a third fraction containing cyclooctene-4-ol-1-formate;

(c) saponifying said cyclooctene-4-ol-1-formate from said third fraction; and

(d) separating in excess of 70% of said cyclooctene-4-ol-1 based on converted cyclooctadiene-1,5 from said formate by distillation.

4,506,106

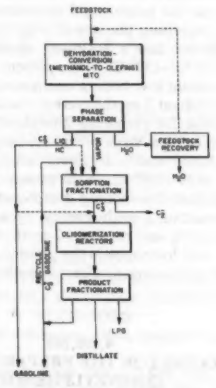
MULTISTAGE PROCESS FOR CONVERTING OXYGENATES TO DISTILLATE HYDROCARBONS WITH INTERSTAGE ETHENE RECOVERY

Chung H. Hsia, Matawan; Hartley Owen, Belle Mead, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 4, 1984, Ser. No. 568,152

Int. Cl.³ C07C *1/20*

U.S. Cl. 585—312 **12 Claims**



1. An integrated continuous process for converting oxygenated organic feedstock to liquid hydrocarbons comprising the steps of contacting feedstock in a primary reactor stage with at least one catalyst comprising acidic zeolite catalyst at elevated temperature and moderate pressure to dehydrate and convert at least a portion of the feedstock to hydrocarbons containing a major fraction of C_2–C_4 olefins and a minor fraction containing C_5^+ heavy hydrocarbons;

cooling and separating primary stage effluent to provide an

aqueous liquid stream, a heavy hydrocarbon liquid stream and a light hydrocarbon vapor stream rich in C_2–C_4 olefins;

fractionating the light hydrocarbon stream by selectively sorbing C_3+ hydrocarbons in a gasoline sorbent stream to recover an ethene-rich vapor stream and a liquid stream rich in C_3+ sorbate;

contacting the sorbate-rich stream in a secondary reactor stage with oligomerization catalyst comprising medium-pore shape selective acidic zeolite at substantially increased pressure and elevated temperature to convert olefins to a heavier liquid hydrocarbon effluent stream comprising olefinic gasoline and distillate range liquids;

fractionating the liquid hydrocarbon effluent stream from the secondary stage to obtain a distillate stream, gasoline stream and lighter hydrocarbon stream;

and recycling at least a portion of the gasoline stream as sorbent.

4,506,107

ELECTRICAL INSULATING OIL AND OIL-FILLED ELECTRICAL APPLIANCES

Atsushi Sato, Tokyo; Keiji Endo, Yokosuka; Shigenobu Kawakami, Ichikawa; Hitoshi Yanagishita, and Shozo Hayashi, both of Yokohama, all of Japan, assignors to Nippon Petrochemical Company, Limited, Tokyo, Japan

Filed Mar. 13, 1984, Ser. No. 588,956

Claims priority, application Japan, Dec. 3, 1983, 58-250735

Int. Cl.[3] H01B *3/24, 9/06;* H01F *27/12;* H01G *4/22*

U.S. Cl. 174—25 C 17 Claims

1. An electrical insulating oil comprising:

(a) at least one member selected from the group consisting of alkyl biphenyls and alkyl naphthalenes, and

(b) at least one member selected from the group consisting of aromatic monoolefins and diolefins having two condensed or noncondensed aromatic nuclei, excluding bicyclic monoolefins of unsaturated dimers and unsaturated codimers of styrenes such as styrene, α-methylstyrene and their monomethyl nuclear substituted compounds.

4,506,108

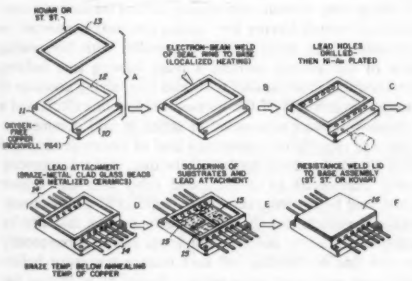
COPPER BODY POWER HYBRID PACKAGE AND METHOD OF MANUFACTURE

Dennis R. Kersch, and Don E. Mitchell, both of Phoenix, Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 1, 1983, Ser. No. 481,128

Int. Cl.[3] H05K *5/04*

U.S. Cl. 174—52 FP 13 Claims


KOVAR OR ST. ST.
ELECTRON-BEAM WELD OF SEAL RING TO BASE (LOCALIZED HEATING)
LEAD HOLES DRILLED, THEN Ni-Au PLATED
OXYGEN-FREE COPPER (ROCKWELL F64)
LEAD ATTACHMENT (BRAZE-METAL CLAD GLASS BEADS OR METALIZED CERAMICS)
SOLDERING OF SUBSTRATES AND LEAD ATTACHMENT
RESISTANCE WELD LID TO BASE ASSEMBLY (ST. ST. OR KOVAR)
BRAZE TEMP. BELOW ANNEALING TEMP OF COPPER

1. A high power hybrid microcircuit package comprising

(a) a base member having a bottom and upstanding side walls together defining an interior volume, said base member being fabricated from a metallurgically hard, elastic, high thermally conductive copper,

(b) a seal ring on the top surface of said side walls, said seal ring having fabricated from a low thermal conductivity weldable metal, said seal ring being welded to said side wall tops by highly localized thermal weld whereby to avoid annealing of said hard copper base member,

(c) a plurality of conductor leads extending through said side walls and having seal members brazed to said side walls, and

(d) a top lid on said seal ring, said lid being fabricated from a low thermal conductivity metal and being resistance welded to said seal ring.

4,506,109

AL-STABILIZED SUPERCONDUCTING WIRE AND THE METHOD FOR PRODUCING THE SAME

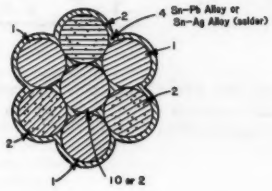
Toshitada Onishi; Hiroshi Tateishi; Kenichi Koyama, all of Niiharu; Shigeo Saito, and Masayuki Nagata, both of Osaka, all of Japan, assignors to Agency of Ind. Science and Technology and Sumitomo Electric, both of Osaka, Japan

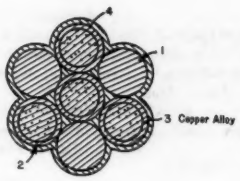
Filed May 26, 1982, Ser. No. 382,363

Claims priority, application Japan, May 28, 1981, 56-81759; May 28, 1981, 56-81760

Int. Cl.[3] H01B *12/00*

U.S. Cl. 174—128 S 6 Claims





1. An aluminum-stabilized superconducting wire consisting essentially of superconducting elementary wires and high purity aluminum wires alternately wound around a core so that said superconducting elementary wires and high purity aluminum wires are in contact with each other, said aluminum wire having high aluminum purity of about 99.99% and above, said core being selected from the group consisting of a superconducting elementary wire, an electrically insulated copper wire, an electrically insulated copper alloy wire, a nonmagnetic metal wire and a nonmagnetic metal alloy, said aluminum wires serving as a stabilizer in said wire arrangement and wherein the entire wire arrangement is impregnated with solder to bond the wound wires together, said impregnated wire arrangement characterized by having high mechanical toughness and improved electrical contact for greater electrical stability and wherein the risk of breakage of the aluminum wire is greatly reduced in a subsequent working process as a result of said impregnated wire arrangement.

4,506,110

HIGH VOLTAGE CORONA SHIELD

Keith I. Gray, La Verne, and Henry G. Meier, Glendale, both of Calif., assignors to Brown Boveri Electric Inc., Rolling Meadows, Ill.

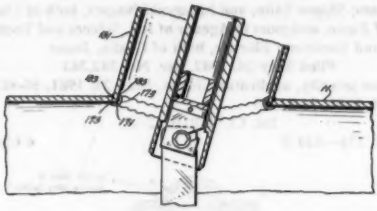
Division of Ser. No. 336,636, Jan. 4, 1982, Pat. No. 4,442,329. This application Jan. 9, 1984, Ser. No. 569,515

Int. Cl.[3] H01T *19/02*

U.S. Cl. 174—144 5 Claims

1. A corona shield structure and an elongated rim of a conductive plate; said rim having a sharp peripheral edge which would create a high enough dielectric stress adjacent said edge in the presence of a high electric field to cause corona discharge at said rim before causing discharge in regions removed from said rim; said corona shield structure comprising an elongated hollow flexible metal corrugated tube having an elon-

gated slot in its wall; said rim being disposed within said slot for the length of said rim which is subject to corona discharge,



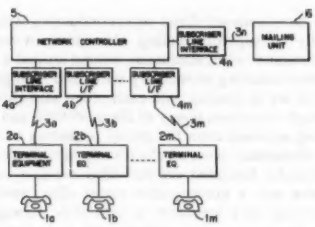
whereby said tube is electrically connected to said rim and produces a greater curvature for corona purposes than said sharp edge would have produced.

4,506,111

TEXT MAILING SYSTEM USING A TELEPHONE LINE

Hiroo Takenouchi, Machida; Hideaki Ishida, Kawasaki, and Kunio Hiyama, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,453
Claims priority, application Japan, Sep. 4, 1981, 56-139272
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 A **10 Claims**



1. A text mailing system comprising:

a plurality of terminal equipments each connected with a telephone set to a telephone line and including means for inputting and outputting a data message on the telephone line, said message including addressee identification information and message text data; and

mail control means connected to a telephone line for receiving messages from said plurality of terminal equipments through an exchanger and for transmitting the received messages to the terminal equipments specified by the addressee identification information in the messages through said exchanger;

said plurality of terminal equipments each having identification input means for inputting addressee identification information; and

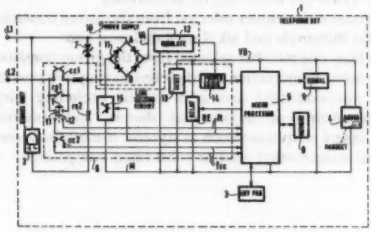
said mail control means including means for transmitting a received message to the terminal equipment indicated in the addressee identification information of the received message on the condition that the addressee identification information inputted at said indicated terminal equipment corresponds to the addressee identification information in the received message for a specified type of message.

4,506,112

TELEPHONE SET INCLUDING A CIRCUIT FOR SEIZING THE LINE WITHOUT LIFTING THE HANDSET OFF THE GRAVITY SWITCH

Philippe Bitsch, Strasbourg, France, assignor to La Telephonie Industrielle et Commerciale Telic Alcatel, Strasbourg, France

Filed Apr. 8, 1983, Ser. No. 483,307
Claims priority, application France, Apr. 9, 1982, 82 06243
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—81 R **6 Claims**



1. A telephone set for connection to a telephone exchange over a telephone line comprising a pair of line wires, the telephone set including: a handset; a gravity switch operated by lifting said handset to seize a telephone line connected to the telephone set by looping said line; a microprocessor and associated electronic circuits requiring DC power for their operation; a diode bridge connected to draw power from a looped telephone line connected to the telephone set and to supply said microprocessor and associated electronic circuits with DC power at a predetermined polarity regardless of the polarity of the wires of the telephone line; said bridge being connected to said microprocessor and associated electronic circuits via a power supply network including a common return line; wherein the telephone set further includes a circuit for seizing the telephone line by looping the line without lifting the handset off the gravity switch, said seizing circuit including a user-operable call switch having line seizing contacts connected on the line side of the diode bridge in parallel with line seizing contacts of the gravity switch, a relay having line holding contacts connected in parallel with said line seizing contacts of the gravity switch and of the user-operable call switch, and a line release transistor connected in series in said common return line and capable of connecting and of disconnecting said common return line from said diode bridge, said microprocessor being connected to control said relay and said release transistor, and being programmed to respond to a user operating said call switch and thereby initially seizing said line by operating said relay to hold the line loop, and to subsequently release the line by turning off said release transistor before releasing said relay, said relay being released after current has ceased to flow in the telephone line, thereby protecting the relay's line holding contacts from being damaged by current surges in the line during release thereof.

4,506,113

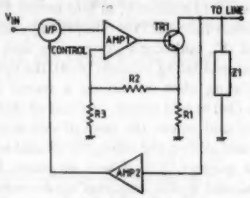
WAVEFORM CLIPPING CIRCUITS

Peter F. Blomley, Bishop's Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

PCT No. PCT/GB82/00069, § 371 Date May 5, 1983, § 102(e) Date May 5, 1983, PCT Pub. No. WO83/03176, PCT Pub. Date Sep. 15, 1983
PCT Filed Mar. 4, 1982, Ser. No. 491,834
Int. Cl.³ H04M *1/60*
U.S. Cl. 179—81 B **5 Claims**

1. A speech processing circuit comprising a variable gain element to provide soft clipping of a speech signal coupled to its input and negative feedback means coupled between an

output of said circuit and said variable gain element to control the gain of said element such that the circuit output impedance



is maintained substantially independent of the amplitude of said speech signal.

4,506,114

TELEPHONE CIRCUIT

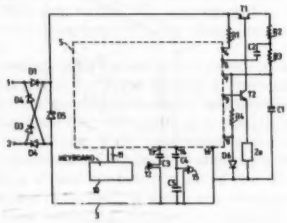
Kenneth N. Burgin, Swindon, England, assignor to U.S. Philips Corporation, New York, N.Y.

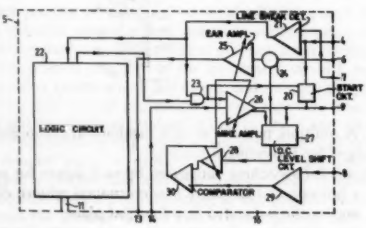
Filed Jul. 18, 1983, Ser. No. 514,401

Claims priority, application United Kingdom, Aug. 25, 1982, 8224347

Int. Cl.³ H04M *1/00, 1/60, 1/76*

U.S. Cl. 179—81 A **7 Claims**





1. A subscriber's telephone speech and line signalling circuit comprising an integrated circuit powered by the exchange battery through the subscriber's line, the integrated circuit being connected to the subscriber's line through the collector-emitter path of a transistor, the power supply for the integrated circuit being maintained during line breaks by the charge on a capacitor which is charged from the exchange battery through the collector-emitter path of the transistor when the subscriber's line is looped, and means for preventing the discharge of the capacitor through said transistor when a line break is detected, said means being adapted to reduce the conductivity of said transistor to such a value that no significant current passes through it from said capacitor for the duration of the line break by applying an appropriate signal to the control electrode of the transistor.

4,506,115

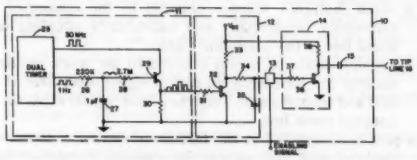
MESSAGE ALERT SYSTEM

Paul M. Schmitt, Needham, Mass., assignor to GTE Communications Products Corporation, Waltham, Mass.

Filed Sep. 12, 1983, Ser. No. 530,935

Int. Cl.³ H04M *1/64*

U.S. Cl. 179—84 C **1 Claim**



1. A "message waiting" lamp system for use with a plurality of telephone handsets having individual tip and ring lines, said "message waiting' lamp system comprised of:

a. a transmitter including:

a signal generator for providing an out-of-band carrier signal modulated with a modulating signal, wherein said modulating signal has a ramp waveform;

a gate corresponding to each handset, and having an input coupled to the signal generator and an output, said gate arranged to turn on in response to an enabling signal;

a capacitor tapping the tip line of a corresponding handset and coupled to the output of said gate; and

b. a receiver located in proximity to a handset, including:

means for separating the modulated carrier signal from DC voltage carried by the tip line;

means for demodulating said signal and obtaining a square wave; and

a lamp arranged to light in response to the square wave.

4,506,116

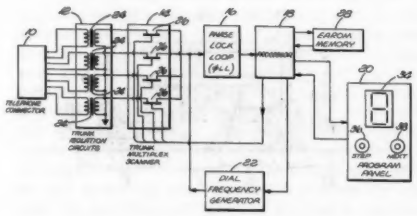
SECURITY DIALING SYSTEM FOR LONG DISTANCE TELEPHONE SYSTEMS

Leonard J. Genest, 1061 Tropic La., Santa Ana, Calif. 92705

Filed Jul. 18, 1983, Ser. No. 514,395

Int. Cl.³ H04M *1/272*

U.S. Cl. 179—90 BD **2 Claims**



1. An automatic dialing device for a trunk telephone system having at least one Touch Tone telephone, each comprising a multibutton dialer for generating tone signals in response to the depression of the dialer buttons, a telephone trunk having at least one trunk line interconnected to a telephone network and a signal line for coupling tone signals from each telephone to the telephone trunk, the automatic dialing device interconnected to the telephone trunk for automatically generating, for transmission on the telephone network through the telephone trunk, a first sequence of tone signals in response to a first single frequency tone signal caused by the simultaneous depression of two of the dialer buttons of one of the telephones interconnected to the telephone trunk, and thereafter automatically generating a second prestored sequence of tone signals in response to the generation of a second single frequency tone

signal caused by the simultaneous depression of two of the dialer buttons, on one of the telephones interconnected to the telephone trunk, the automatic dialing device comprising:

a connector coupled in the telephone trunk to enable receipt of the first and second single frequency tone signals from one of the telephones interconnected to the telephone trunk and to enable injection of a sequence of tone signals from the automatic dialing device to the telephone network through the telephone trunk;

a trunk multiplex scanner coupled to the connector for repeatedly, sequentially and individually coupling each trunk line in the telephone trunk;

frequency detection means coupled to the trunk multiplex scanner for generating an output signal when one of the first and second single frequency tone signals exists on the coupled trunk line;

a processor coupled to the frequency detection means and the trunk multiplex scanner for receiving the output signal from the frequency detection means and terminating scanning of the trunk multiplex scanner for at least as long as the output signal is generated, retaining the connections between the trunk line on which the one of the first and second single frequency tone signals occurs, and enabling output of a first tone command sequence and a second tone command sequence upon termination of the first and second single frequency tone signals respectively if the output signal of the frequency detection means has persisted respectively for at least a first and second predefined period of time; and

tone signal generator means coupled between the processor and the trunk multiplex scanner to receive the first and second tone command sequences from the processor and generate the first and second tone signal sequences in response to the respective first and second tone command sequence, the first and second tone signal sequences being coupled to the telephone trunk.

4,506,117

ELECTROACOUSTIC TRANSDUCER

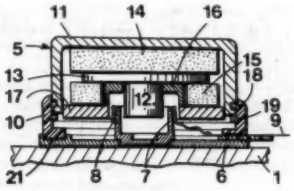
Marcel Fresard, Petit-Lancy, Switzerland, assignor to Multiphonie S.A., Geneva, Switzerland

Filed Dec. 15, 1982, Ser. No. 450,184

Claims priority, application Switzerland, Dec. 22, 1981, 8199/81

Int. Cl.³ H04R *9/06*

U.S. Cl. 179—114 R **1 Claim**



1. An electroacoustic transducer (5) comprising a magnetic frame (11–17) provided with a circular cylindrical air gap and including a bell shaped member (11), an oscillating element including a metal base plate (6), a cylindrical part (7) and a coil (8), said coil (8) mounted on said cylindrical part (7) and disposed in said air gap, said metal plate (6) provided with holes (20) to permit attachment of said oscillating element to a panel (1) by screw means, said magnetic frame (11–17) constituting an inertial mass and connected to said base plate by means of an elastomer member (10), characterized in that said elastomer member (10) comprises a ring which is connected in an air tight, dust free manner to said magnetic frame and to said metal plate (6), said ring including a pair of annular ribs (18,19), one of said ribs (18) engaged in a peripheral groove in said magnetic frame (11–17), the other said rib (19) supporting the lower edge of said bell shaped member (11), said base plate having a groove (21) therein, the base of said ring engaged in said last mentioned groove, means (22–24) for exerting force on said elastomer member (10) in such a manner as to modify its characteristics of elasticity, in said means for exerting force on said elastomer member (10) comprising a screw (22) coaxial with said coil (8), said screw connecting said magnetic frame (11–17) to said oscillating element (6–8), the cylindrical part (7) of said oscillating element having a recess (25) therein, an elastic sleeve (24) in said recess, one end of said sleeve abutting an end wall of said recess, the head of said screw engaging the other end of said sleeve, the other end of said screw threadedly engaged in a magnet (12) of said magnetic frame, whereby adjustment of said screw increases or decreases the force on said elastic sleeve to obtain optimum conditions of diffusion of sound waves.

4,506,118

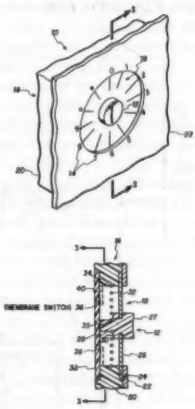
MULTIPLE POSITION ELECTRICAL SWITCH

Walter G. Mollman, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 15, 1983, Ser. No. 485,562

Int. Cl.³ H01H *9/00, 15/00;* **H04M** *1/30*

U.S. Cl. 200—1 R **2 Claims**



1. A multiple position switch mechanism comprising:

means for providing a housing;

means for switching supported by said means for providing a housing and having a predetermined pattern of switching locations located in a first flat plane;

a movable means for activating said means for switching contained at least partially within said means for providing a housing and having an initial rest position different from said switching locations wherein said means for switching is activated by moving in a second flat plane parallel to said first flat plane said means for activating to said switching locations;

means for biasing attached to said means for activating and to said means for providing a housing such that said means for activating returns to said initial rest position after being moved to said switching location; and

means for guiding said means for activating to said switching location, said means for guiding being attached to said means for providing a housing and in contact with said means for activating at least when said means for activating is moved into close proximity to said switching location.

4,506,119

SNAP ACTION SLIDE SWITCH WITH WIPING ACTION

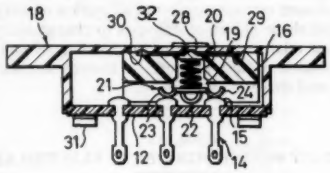
Yoshio Tanabe, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1983, Ser. No. 519,683

Claims priority, application Japan, Aug. 3, 1982, 57-117349[U]

Int. Cl.³ H01H 15/00, 21/04

U.S. Cl. 200—16 C 9 Claims



1. A slide switch comprising:

a switch case;

a terminal place made of an electric insulator and fixed to said switch case;

a plurality of fixed terminals fixed in said terminal plate so as to be arrayed at equal intervals, each of said fixed terminals having a contact portion formed with an arcuate face;

a slider made of an electric insulator, said slider being received within said switch case and adapted to be guided by said switch case so as to move along the array of said terminals;

a movable contact piece received in a cavity of said slider, said movable contact piece having a corrugated shape including three arcuate protrusions, said movable contact piece being such that side walls of a trough formed between a central one of the protrusions and a respective sideward protrustion is adapted to abuttingly receive the arcuate face of said contact portion of one of said fixed terminals, that in the state in which said contact portion of said one fixed terminal is received, an inclined surface of that end part of said movable contact piece which lies on the same side as said central protrusion thereof with respect to said trough can abut on the inclined face of the contact portion of the fixed terminal adjoining said one fixed terminal, and that said movable contact piece can touch only said contact portion of said one fixed terminal, depending upon positions of the movement thereof; and

a compression spring which has its one end retained in opposition to said central protrusion of said movable contact piece and its other end retained in said cavity of said slider, said compression spring being adapted to hold said movable contact piece in pressed ocntact with the contact portions to permit said movable contact piece to turn in accordance with a pressure angle at the pressed contact between the arcuate face of said contact portion and the central protrusion of said movable contact piece.

4,506,120

ARRANGEMENT FOR PREVENTING OPERATION OF AN ELECTRIC SWITCH

Jonas Fleischman, 167 Ross St., Brooklyn, N.Y. 11211

Filed Nov. 18, 1982, Ser. No. 442,527

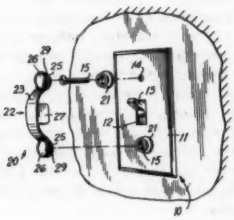
Int. Cl.³ H01H 3/20, 9/20

U.S. Cl. 200—42 R 1 Claim

1. An arrangement for preventing operation of a wall-mounted electric toggle switch of the type including a switch body including a switch housing, a cover plate having an elongated rectangular slot, a pair of connecting screws connecting the cover plate to the switch housing at locations situated beyond and in alignment with the slot, and an actuating member mounted in the switch housing for pivoting along a predetermined trajectory and extending through the slot of the cover plate to the exterior of the switch, for selectively preventing access to the actuating member and thus operation of the switch, said arrangement comprising:

a substantially strip-shaped protecting element having a pair of spaced-apart end mounting portions, a central portion intermediate the latter and situated outwardly of the predetermined trajectory and extending along a course substantially outwardly hugging the predetermined trajectory, and two lug portions on the central portion and extending toward the cover plate at both sides of said element and of the predetermined trajectory to prevent lateral access to the actuating member, said element portions being configured as to substantially prevent access to the actuating member when placed in a predetermined position on the switch; and

snap-action means for removably holding said protecting element in said predetermined position thereof relative to the switch, said snap-action means including two cooperating pairs of substantially pin-shaped male formations and substantially socket-shaped female formations, said male formations being rigid with the switch body and including through-extending apertures through which said connecting screws may be directed prior to their threadable engagement with said switch housing thereby to permit said male formations to be fixedly mounted on the connecting screws of the switch, said female formations being rigid with said protecting element and being mounted on the mounting portions of said protecting element, said two pairs of said formations engaging each other with snap action in said predetermined position, one of each two cooperating formations having a circumferential groove at a circumferential surface thereof facing the other formation in said predetermined position, and a resilient ring accommodated in said groove and yieldable in the radial direction to engage and disengage said other formation with snap action during movement of said pin-shaped male formation into and out of said socket-shaped female formation, each female formation having a rounded finger- or thumb-pressing surface to press the respective female formation onto and into engagement with the associated cooperating male formation, said lug portions on said protecting element extending toward the cover plate for a distance sufficient to serve as a convenient handhold for a user to grasp and disengage said female formations from said male formations.



4,506,121

ANTI-OVERLOAD OPERATING LINKAGE FOR ENCLOSED INTERLOCKED RECEPTACLE WITH SAFETY SWITCH OR CIRCUIT BREAKER

Brian P. Peterson, Jamesville, and Patrick J. Murphy, Camillus, both of N.Y., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Nov. 10, 1982, Ser. No. 440,729

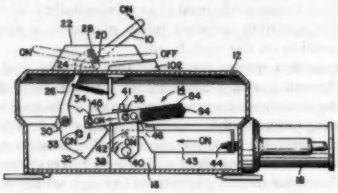
Int. Cl.³ H01H 9/20

U.S. Cl. 200—50 B 20 Claims

1. In a dead front safety device having a reset handle connected to a mechanism for energizing a safety circuit by a

multi-component mechanical operating linkage for transmitting an operating force applied to said reset handle to said energizing mechanism when said circuit has been opened, and having an interlock for preventing movement of said energizing mechanism until the release of said interlock by the undertaking of collateral safety-related procedure, the improvement comprising a force override compensating linkage as a component of said mechanical operating linkage, said compensating linkage comprising:

a. a force-receiving member to which a driving force corresponding to said operating force is applied;



b. a force-transmitting member movably connected to said force-receiving member and operably connected through components of said operating linkage to said energizing mechanism for imparting thereto an activating force corresponding to said driving force; and

c. bias means for transferring said driving force to said force-transmitting member by moving said force-receiving member in rigid relation with said force-transmitting member, said bias means permitting movement of said force-receiving member relative said force-transmitting member whenever said operating force exceeds a predetermined value.

4,506,122

SELECTION SWITCH

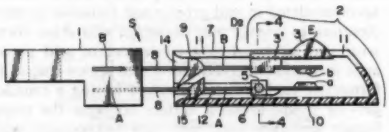
Muneyoshi Miyata, Tokyo, Japan, assignor to Mitsuku Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1983, Ser. No. 493,567

Claims priority, application Japan, May 22, 1982, 57-75500; May 22, 1982, 57-75501

Int. Cl.³ H01H *3/16*

U.S. Cl. 200—61.58 R **5 Claims**



1. A selection switch for identifying an object having a predetermined shape at a predetermined portion thereof, said switch comprising:

an insulating base;

at least two spring-biased contact members ebedded at a part thereof in said based so as to extend substantially in parallel with each other from said base;

contacts respectively provided on said spring-biased contact members so as to oppose to each other with a predetermined constant relative position;

a guide member having a guide surface of a predetermined width formed on a portion thereof and connected to one of said spring-biased contact members so as to allow said guide surface to slidably guide said predetermined portion of said object coming into contact therewith along a predetermined direction and to bend said one spring-biased contact member;

means maintaining said predetermined relative position between said contacts during bending of said one contact member by said guide member; and

a selector provided on the other of said spring-biased contact members, said selector being formed thereon with a triangular projection of which the upper portion is outwardly projected by a predetermined distance through and from said guide surface,

wherein said triangular projection of said selector can be forcedly pushed to the position of said guide surface by said object contacting therewith while bending said other spring-biased contact member as a function of said predetermined shape of said object so as to change said predetermined relative position by the bending of said other spring-biased contact member, to thereby automatically detect said shape of said object.

4,506,123

CONTACT DEVICE FOR HEAVY ELECTRICAL CURRENTS

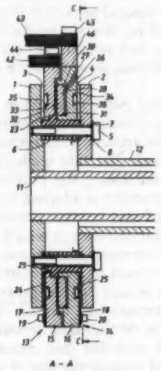
Herbert Kaufmann, and Jan Larsson, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Jan. 12, 1983, Ser. No. 457,475

Claims priority, application Sweden, Jan. 15, 1982, 8200202

Int. Cl.³ H01H *35/40*

U.S. Cl. 200—83 J **7 Claims**



1. In an electrical contact device for intermittent transmission of heavy electrical currents between two units which are rotatable relative to one another, comprising

a spaced apart pair of annular contact segments on one unit which are axially fixed relative to each other,

a pair of annular contact segments on the other unit which are axially displaceable relative to each other, and

operating means for axial displacement of the displaceable contact segments towards the axially fixed contact segments,

the improvement wherein

one of said pair of axially displaceable contact segments includes a cylindrical channel,

the operating means includes a ring piston slidingly movable within said cylindrical channel to displace the axially displaceable contact segments away from each other and towards the axially fixed contact segments,

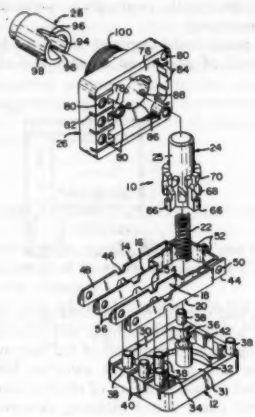
a centering device is provided for said axially displaceable contact segments which ensures a clearance between each axially fixed contact segment and its adjacent axially displaceable segment when the latter pair of segments contact said centering device, and

spring means is provided to urge the axially displaceable contact segments towards each other and towards said centering device.

4,506,124
PUSH-PUSH SWITCH

William H. Rose, Harrisburg; David W. Rupnik, Mechanicsburg, and David T. Shaffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 19, 1983, Ser. No. 543,667
Int. Cl.³ H01H *13/56*
U.S. Cl. 200—153 J 13 Claims



1. A push-push switch, comprising:

a dielectric housing having electrical contact members secured therein, contact sections of the contact members are in normal electrical engagement and terminal sections of the contact members are electrically connectable with conductive members;

an actuating member mounted in the housing for reciprocal and rotational movement therein;

a spring biases the actuating member to a normal rest position;

cam members on the actuating member engage the contact members in one position to disengage them and are out of engagement with the contact members in another position causing them to be normally engaged whereby the cam members during the reciprocal and rotational movement of the actuating member always remain in operative alignment with the contact members;

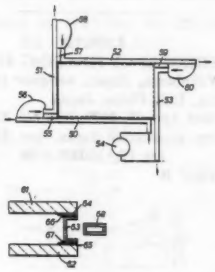
first and second rows of cam segments on the actuating member, the cam segments in each of the rows are spaced from one another and the cam segments in the first row are offset with respect to the cam segments in the second row so that cam surfaces of the cam segments of the first row face the cam segments of the second row and cam surfaces of the cam segments of the second row face cam segments of the first row; and

projections extend outwardly from the housing and are normally positioned between adjacent cam segments in the first row whereby upon movement of the actuating member from its normal rest position against the spring, the projections engage respective cam surfaces of the cam segments of the second row causing the actuating member to rotate so that the projections are in alignment with respective cam surfaces of the cam segments of the first row, and, upon movement of the actuating member back to normal rest position, the projections engage the respective cam surfaces of the cam segments of the first row causing the actuating member to rotate further so that the projections are disposed between adjacent cam segments of the first row and the cam members move into engagement with the contact members to disengage the contact sections or move out of engagement with the contact members so that the contact sections are engaged.

4,506,125
GLAZING PANELS AND THEIR BONDING

Jacques Smets, Brussels, and Michel Laurent, Nivelles, both of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed May 26, 1983, Ser. No. 498,572
Claims priority, application United Kingdom, May 28, 1982, 8215715
Int. Cl.³ B23K *13/02*
U.S. Cl. 219—10.53 26 Claims

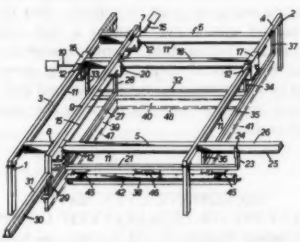


17. Induction heating means for induction heating a heat-activatable bonding medium present along the margin of an assembly of facing polygonal sheets to cause the sheets to be bonded together, wherein said induction heating means comprises an inductor in the form of a polygonal loop positioned to extend around the edge of such an assembly, each side of said loop being formed by at least one conductor of tubular bar or of rod form, and wherein at least one side of said loop is movable relative to at least one other side of said loop.

4,506,126
METHOD AND APPARATUS FOR BONDING GLAZING PANELS

Jacques Smets, Brussels, and Michel Laurent, Nivelles, both of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed May 26, 1983, Ser. No. 498,573
Claims priority, application United Kingdom, May 28, 1982, 8215716
Int. Cl.³ H05B *6/64*
U.S. Cl. 219—10.53 26 Claims



1. A method of manufacturing an individual glazing panel composed of two sheets, said method comprising: providing electrically conductive means having a heat-activatable bonding medium between the sheets and around the margin of the individual panel to allow the bonding medium to form a joint which joins the sheets together when the bonding medium is activated in situ by induction heating; disposing an inductor around the individual glazing panel for inductively coupling the inductor to the electrically conductive means of the individual panel so that the inductor and the electrically conductive means together constitute an output load having a charac-

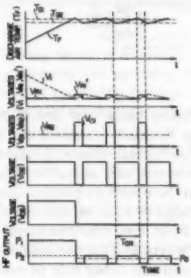
teristic resonant frequency, the inductor being associated with the electrically conductive means for causing the bonding medium to be heated simultaneously at all positions along the margin when electrical power is supplied to the output load; applying power to the output load from a generator which can be set to supply power at a selected level for inducing in the output load an induction heating current at the characteristic resonant frequency; and selecting the level of power supplied by the generator to the load in dependence on the instantaneous characteristic resonant frequency of the output load.

4,506,127

HIGH-FREQUENCY HEATING APPARATUS

Kenji Satoh, Yokohama, Japan, assignor to Hitachi Heating Appliances Co., Ltd., Chiba, Japan

Filed Apr. 25, 1979, Ser. No. 33,340
Claims priority, application Japan, Apr. 28, 1978, 53-51128
Int. Cl.³ H05B *6/68*
U.S. Cl. 219—10.55 B **20 Claims**



1. A high-frequency heating apparatus comprising:
a heating chamber which is capable of accommodating an object to be heated therein;
first means for generating high-frequency energy and for supplying the generated high-frequency energy into said heating chamber;
second means for sensing the temperature of an object placed within said heating chamber and for providing an output representative thereof; and
control means responsive to the output of said second means for controlling said first means to reduce the output high-frequency energy of said first means after the output of said second means has reached a first predetermined value, and including third means for intermittently interrupting the reduced output of said first means, after the output of said second means has reached said first predetermined value, in accordance with the output of said second means.

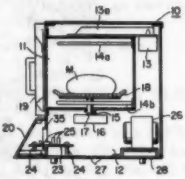
4,506,128

MICROWAVE OVEN HAVING SPECIALLY-POSITIONED ELECTRIC COMPONENTS

Takamichi Sujaku, Nagoya; Shuki Aoyama, Aichi, and Takaaki Fukasawa, Nagoya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaka, Japan

Filed Oct. 17, 1983, Ser. No. 542,448
Claims priority, application Japan, Oct. 18, 1982, 57-182524
Int. Cl.³ H05B *6/74*
U.S. Cl. 219—10.55 F **2 Claims**

1. A microwave oven having specially positioned electric components comprising:
an oven cabinet having a front wall, a rear wall, side walls, a top wall, and a bottom wall, said front wall being shorter than said rear wall and including an access opening for a foodstuff to be cooked, and said bottom wall being longer than said top wall and including a plurality of ventilation holes;
a heating chamber formed in said oven cabinet;
a turntable disposed within said heating chamber and attached to a shaft extending through a bottom of said heating chamber;
an oven door pivotably mounted on the front wall of said oven cabinet;
a plurality of electric components located in the oven cabinet for electrically controlling operation of the microwave oven; and
a control panel board disposed between a lower end of the front wall of said oven cabinet and the bottom wall



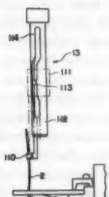
thereof, said control panel including an indicator for displaying a cooking condition and control switches for setting operating conditions of the microwave oven, said indicator and said control switches being electrically connected to said plurality of electric components,
said control panel board inclining downwardly and outwardly from the lower end of the front wall of the oven cabinet to the bottom wall thereof and defining with said bottom and side walls a space positioned below said heating chamber and toward the front of said cabinet containing at least part of said plurality of electric components so as to protect said at least part of said plurality of electric components contained in said space from liquids and to dissipate heat transmitted from said heating chamber.

4,506,129

APPARATUS FOR PROCESSING A BROKEN WIRE ELECTRODE USED DURING ELECTRO-DISCHARGE MACHINING

Hideo Katsube; Gotaro Gamo; Mitsuo Kinoshita, and Yoshiyuki Nomura, all of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Minamitsuru, Japan

PCT No. PCT/JP81/00280, § 371 Date Jun. 7, 1982, § 102(e) Date Jun. 7, 1982, PCT Pub. No. WO82/01339, PCT Pub. Date Apr. 29, 1982
PCT Filed Oct. 14, 1981, Ser. No. 387,842
Claims priority, application Japan, Oct. 14, 1980, 55-143415
Int. Cl.³ B23P *1/08*
U.S. Cl. 219—69 W **3 Claims**



1. In an apparatus for processing a broken wire electrode in a wire-cut electric discharge machine for cutting a workpiece from a starting position into a desired contour by electric discharge machining while the workpiece is transported relative to a wire electrode on the basis of machining command

data, the apparatus having a wire nozzle, being rethreaded manually and comprising:

a memory for storing the position at which the wire electrode broke;

manually operated means for generating feed pulses following wire breakage to transport the workpiece from the wire breakage position to an exposed rethreading position noncoincident with the wire nozzle permitting convenient manual rethreading of the wire in a wire transfer system;

means for generating feed pulses to position the workpiece at the wire breakage position, after the wire electrode has been manually rethreaded in the wire transfer system, by moving the workpiece along a straight line from the exposed rethreading position back to the wire breakage position; and positioning means for positioning the workpiece relative to the wire electrode in dependence upon the feed pulses.

4,506,130

METHOD AND APPARATUS FOR ELECTROSLAG WELDING

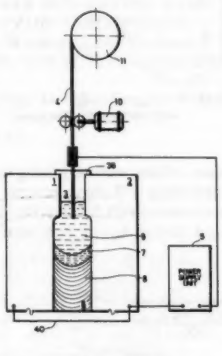
Imre Oszlár; András Beck, both of Budapest, and Gábor Mohácsi, Dunaharaszti, all of Hungary, assignors to Csepel Müvek Egyedi Gépgyära, Hungary

Filed Feb. 14, 1983, Ser. No. 466,314

Claims priority, application Hungary, Mar. 1, 1982, 614/82

Int. Cl.³ B23K *25/00*

U.S. Cl. 219—73.1 **13 Claims**



1. A method of electroslag welding two workpieces together, comprising:

selecting an optimum value for the width of a vertical slot to be provided between the two workpieces;

selecting a non-zero value range for a plurality of electrical parameters necessary for welding the workpieces together;

arranging the workpieces to establish the slot with said width of optimum value therebetween, said slot extending vertically between the workpieces;

laterally closing said slot;

guiding at least one welding filler wire into said slot;

providing a supply unit capable of supplying said plurality of electrical parameters in said value range, said supply unit having at least two electrical power supply poles;

connecting one of the poles of the supply unit to said at least one welding filler wire;

connecting at least one of the two workpieces to another pole of the supply unit;

activating the supply unit for supplying the plurality of electrical parameters between the at least one workpiece and said welding filler wire;

feeding said welding filler wire in the slot; and

simultaneously with said feeding of said welding filler wire, pulsating by altering at least one of said electrical parameters within said value range in pulses lasting several seconds so that an optimal crystal structure of an intermittent weld formed in said slot is produced.

4,506,131

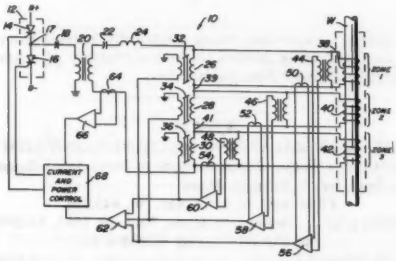
MULTIPLE ZONE INDUCTION COIL POWER CONTROL APPARATUS AND METHOD

Paul C. Boehm, Marlton; John H. Mortimer, Medford; Henry M. Rowan, Rancocas, and Robert C. Turner, Beverly, all of N.J., assignors to Inductotherm Industries Inc., Rancocas, N.J.

Filed Aug. 29, 1983, Ser. No. 527,148

Int. Cl.³ H05B *6/08*

U.S. Cl. 219—10.77 **15 Claims**



1. Induction heating apparatus for providing a desired temperature profile in a workpiece to be heated, comprising:

(a) an induction heating coil having a plurality of zones,

(b) a high-frequency induction power supply for delivering power to the coil,

(c) control means for individually controlling the power delivered to each zone of the coil, the control means comprising:

(i) means for measuring the power in each zone,

(ii) means for comparing the power in each zone to a predetermined reference and generating a first control signal based on the comparison for each respective zone,

(iii) means operatively associated with each zone and responsive to the first control signal associated with the respective zone for diverting electric current around the respective zone to thereby control the power delivered to the respective zone,

(iv) means for determining total power delivered by the power supply,

(v) means for adding the power in each zone to determine a total power in all zones, and

(vi) means for comparing the total power in all zones to the total power delivered by the power supply and generating a second control signal based on the comparison for controlling the total power delivered by the power supply.

4,506,132

INDUCTION COIL IN THE FORM OF A FLAT COIL FOR CRUCIBLE-FREE FLOATING ZONE MELTING

Wolfgang Keller, Munich, Fed. Rep. of Germany, assignor to Siemens Katiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,781

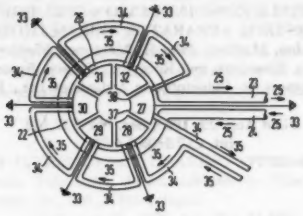
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1981, 3143146

Int. Cl.³ H05B *6/36*

U.S. Cl. 219—10.79 **24 Claims**

1. Flat induction heating coil for crucible-free zone melting a semiconductor crystalline rod having a turn annularly surrounding the semiconductor rod, the turn being formed with at

least one passage therethrough for a cooling liquid, comprising an energy concentrator located at an inner side of the heating coil turn facing towards the semiconductor rod to be melted,



said energy concentrator being electrically isolated from the coil turn and being subdivided into a plurality of segments electrically isolated from one another.

4,506,133

DYNAMIC BALANCING MACHINE USING EDM

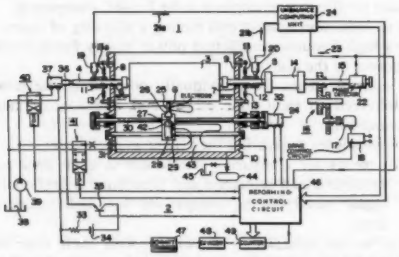
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Nov. 29, 1982, Ser. No. 445,104

Claims priority, application Japan, Nov. 30, 1981, 56-190633

Int. Cl.³ B23P *1/08*; G01M *1/38*

U.S. Cl. 219—69 C **2 Claims**



1. A dynamic balancing machine, comprising:

a pair of oscillatory bearing means for resiliently supporting a conductive workpiece rotatably about a horizontal axis;

means for rotating said conductive workpiece about said horizontal axis;

computing means responsive to the rotation and oscillations of the rotating conductive workpiece about said horizontal axis for computing amounts and positions of local unbalance of the workpiece;

means for fixing the axis of rotation of said conductive workpiece in alignment with said horizontal axis to enable said conductive workpiece to rotate without oscillations;

non-mechanical tool means positionable in machining relationship with respective regions of said computed positions for reforming said conductive workpiece;

drive means responsive to said computing means for displacing said tool means to successively locate the same in machining relationship with said regions of the conductive workpiece while in rotation about said aligned axis; and

control means responsive to said computed means for controlling parameters of machining by said tool means located in machining relationship with each of said regions so as to compensatorily eliminate a respective one of said computed amounts, thereby reforming said conductive workpiece, said tool means comprising an electroerosive machining electrode, means for supplying dielectric machining fluid into a gap between said machining electrode and said conductive workpiece, and an electroerosive machining power supply for passing an electroerosive machining current in the form of discrete discharges of fixed duration and level between said machining electrode and said conductive workpiece to electroerosively remove material from the conductive workpiece across said gap in the presence of said machining fluid with a fixed amount of stock removed from said workpiece per discharge, said control means being adapted to act on said power supply for varying the number of said discharges to remove corresponding computed amounts of material from said conductive workpiece.

4,506,134

FLASH BUTT WELDING METHOD

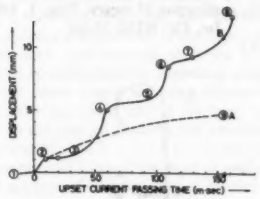
Masashi Ichikawa; Toru Saito, and Takeshi Nishi, all of Sagamihara, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 7, 1984, Ser. No. 577,782

Claims priority, application Japan, Feb. 10, 1983, 58-19642

Int. Cl.³ B23K *11/04*

U.S. Cl. 219—100 **1 Claim**



1. In a flash butt welding method joining together two pieces of steel and comprising a flashing process and an upsetting process, the improvement which comprises the steps of passing a current having a current density I (A/mm²) that is not lower than

$$120\sqrt{\frac{1500 - To}{1500}}\ V$$

(where To is the temperature (°C.) to which the portion near the abutting surfaces is preheated before flashing is started and V (mm/sec.) is the ultimate flashing rate) through the abutting surfaces of the workpieces, achieving upsetting at a mean speed of not lower than 50 mm/sec., and applying an ultimate upsetting force of under 5 kg/mm² when upset current is cut off.

4,506,135

METHOD AND APPARATUS FOR MANUFACTURING HEAT EXCHANGER TUBES

Gerhard Ziemek; Friedrich Schatz, both of Langenhagen; Dieter Müller, Wedemark, all of Fed. Rep. of Germany, and Douglas W. Rowell, Woodbury, Conn., assignors to kabelmetal electro Gesellschaft mit beschränkter Haftung, Hanover, Fed. Rep. of Germany

Filed Jan. 21, 1983, Ser. No. 459,868

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1982, 3215381

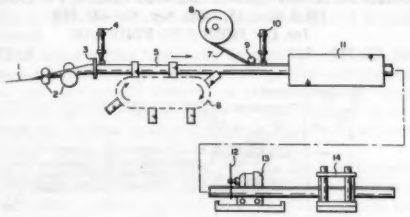
Int. Cl.³ B23K *9/225*

U.S. Cl. 219—107 **35 Claims**

1. A method of manufacturing heat exchanger tubes of predetermined length, particularly absorber tubes for solar collectors, from a metal tube having a tangential surface to increase the effective surface of the tube, said method comprising

feeding a metal strip to a continuously entering longitudinal tube,

continuously along the entire length of the tube fastening said strip tangentially to the tangential surface of the tube in the longitudinal direction of the tube by arc through-welding from the side of the strip opposite the tube with



DC welding current of predetermined varying but uninterrupted value so as to form a continuous welding along the entire length of the tube having predetermined stronger welding regions and lighter welding regions and thereafter

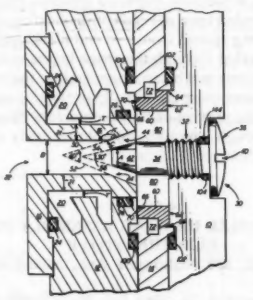
cutting the tube into predetermined lengths.

4,506,136

PLASMA SPRAY GUN HAVING A GAS VORTEX PRODUCING NOZZLE

Richard T. Smyth, Huntington, and Raymond A. Zatorski, Port Jefferson Station, both of N.Y., assignors to Metco, Inc., Westbury, N.Y.

Filed Oct. 12, 1982, Ser. No. 434,138
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—121 PL **23 Claims**



1. A plasma spray gun comprising, in combination:

a nozzle member with a substantially cylindrical bore and a substantially conical shape portion communicating with said cylindrical bore, an electrode with a truncated conical shaped tip disposed relative to said nozzle so that at least a portion of said tip is disposed symmetrically with respect to and radially inward of the wall of said conical shaped portion of said nozzle member;

plasma gas distribution means disposed radially outward of and encircling said electrode for introducing plasma gas into the region disposed between said electrode and said nozzle to produce a uniform vortex flow of plasma gas in the region disposed between said electrode and said nozzle; and

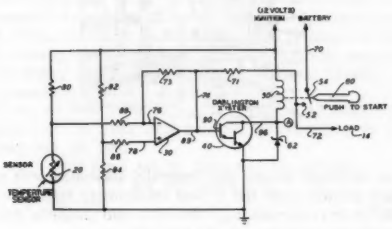
a tangential gas introducing passage communicating at one end thereof with said gas distribution means and for coupling at the other end thereof to a source of plasma gas, said gas introducing passage being disposed to cause gas flow into and around said gas distribution means in one direction.

4,506,137

TEMPERATURE RESPONSIVE CONTROL CIRCUIT FOR ELECTRIC WINDOW DE-FOGGER/DEICER HEATER

Jack B. Meister, 68 Chimney Ridge, Convent Station, N.J. 07961

Filed Feb. 18, 1983, Ser. No. 467,923
Int. Cl.³ H05B *1/02*; E06B *7/12*
U.S. Cl. 219—203 **2 Claims**



1. In combination with an automobile window having a heating grid for vaporizing fog and melting ice therefrom, the improvement which comprises an apparatus for supplying electric current to said grid, said apparatus including a manually operated mechanical switching relay for turning on the flow of current to said grid, manually operable means operated by the driver of the automobile for closing said switching relay to cause current to begin flowing through said grid when the driver feels that an unacceptable amount of fog or ice has accummulated on the automobile window, a holding circuit for said switching relay energized by said current flow for maintaining said switching relay in closed position once it is closed by said driver, a sensor comprising an electrical resistance in heat exchange relationship with the surface of said window from which the fog or ice is to be removed and whose resistance changes with changes in the temperature of said surface, and a transistorized circuit responsive to a change in said resistance for reducing the said current flow through said holding circuit to the point where it no longer will maintain said switching relay in closed position, whereby the current flow through said heating grid is turned off automatically and will remain off until the driver again manually operates said mechanical switching relay.

4,506,138

MAGNETICALLY ATTACHABLE ELECTRIC PREHEATER FOR AUTOMOBILE ENGINES

James W. Bennett, Wrenshall; Gary L. Howe, Mankato; Kenneth A. Jaakola, Cloquet, and Samuel G. Koutavas, Faribault, all of Minn., assignors to Future Tech, Inc., Mankato, Minn.

Filed May 5, 1983, Ser. No. 491,870
Int. Cl.³ F01M *5/02*; F02N *17/04*; H05B *3/20*
U.S. Cl. 219—205 **12 Claims**

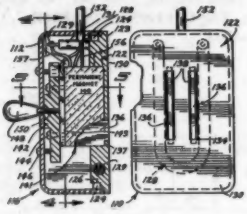
1. An electrical heater for heating an object having a wall of magnetically attractable material includes:

A. an outer case having an opening therein of size and configuration commensurate with the size and shape of the portion of the object wall to which heat is to be applied;

B. a heat transfer of non-magnetic material having relatively good heat conductivity, said plate substantially filling said case opening, said plate providing an outwardly facing working face, and being provided with a pair of spaced-apart magnetic means receiving openings therethrough;

C. magnetic means operative in the plane of the heat transfer

plate working face to fix and retain the heat transfer plate in heat transferring relation to said object wall when the working face is brought into contact with the object wall, said magnetic means including two magnetic outer end portions, each extending through a different one of the provided magnetic means receiving openings in the heat transfer plate, and each magnetic outer end portion having an outer face lying in the plane of the heat transfer plate working face;



D. an electrical heating unit integrally associated with said heat transfer plate and in heat transmitting relation to it and to lie in surrounding relation to said magnetic means receiving openings and said magnetic means;

E. means holding said magnetic means in relatively fixed positon with respect to said heat transfer plate to maintain said outer faces of said magnetic means outer end portions in the plane of the heat transfer plate working face; and

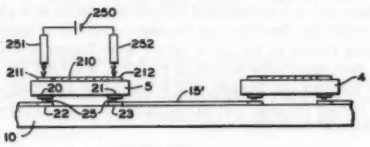
F. an electrical cable extending through the outer case and electrically connected to the electrical heating unit to furnish power to the heating unit.

4,506,139

CIRCUIT CHIP

James M. Daughton, Saint Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 4, 1983, Ser. No. 481,542
Int. Cl.³ H01L *21/58*; B23K *31/02*
U.S. Cl. 219—209 **8 Claims**



5. In combination:

a support structure having a plurality of solderable bonding pads;

silicon monolithic integrated circuit chip having a plurality of bonding pads electrically connected to electrical circuit components integral with said chip, said plurality of bonding pads being located on a first side of said chip, said plurality of bonding pads being adapted to be soldered to corresponding bonding pads on said support structure;

solder material sandwiched between and in physical contact with said plurality of bonding pads of said chip and support structure;

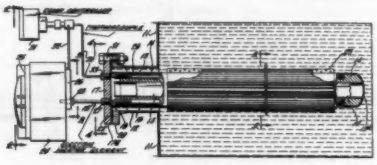
electrical heating means integral with said chip having first and second metallic, electrically conductive pads integral with said chip, said first and second metallic pads located at least in part on a second side of said chip, said first and second metallic pads adapted to be electrically connected to an electrical to an electrical energization source having a magnitude capable of passing a current through said electrical heating means to raise the temperature of said plurality of chip bonding pads, by heat conduction through said chip, sufficient to melt said solderable material.

4,506,140

ELECTRIC IMMERSION HEATER ASSEMBLY HAVING AN ISOLATED TERMINAL BOX

Richard M. Armstrong, Box 566, West Chester, Pa. 19380

Filed Nov. 15, 1982, Ser. No. 441,483
Int. Cl.³ H05B *3/82*; F24H *1/00*
U.S. Cl. 219—315 **12 Claims**



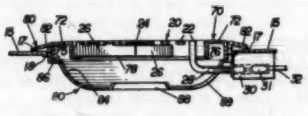
1. An electric heater for use with a receptacle having walls defining a chamber for a fluid to be heated, the heater comprising an elongated heat conductive body adapted to be extended through an aperture in the receptacle wall and be immersed in the fluid to be heated and having a plurality of elongated cavities therein with axes spaced from each other and paralleling the axis of the elongated body, each of said cavities being open at one end of the body and being closed toward the other end thereof, a removable electrical heating element in each of said cavities, each element having a terminal end extended from the open end of the cavity, an end plate mounted on the conductive body adjacent the open ends of the cavities and with a radially projecting portion beyond the body of the heater and having perforations aligned with the open ends of the cavities, the terminal ends of the heating elements being extended through said perforations, packing devices sealing the perforations around the extended terminal ends, a terminal box for the extended terminal ends of the heating elements, the terminal box being spaced from said end plate and the terminal ends being extended through the space between the end plate and the terminal box and being extended into the terminal box, and means for connecting the radially projecting portion of the end plate with the portion of the receptacle walls surrounding the aperture through which the conductive body of the heater is adapted to extend.

4,506,141

REDUCED SIZE HEATING ASSEMBLY FOR AN ELECTRIC STOVE

Donald W. Scott, 530 Nightingale Ave., Miami Springs, Fla. 33166

Filed Aug. 29, 1983, Ser. No. 526,977
Int. Cl.³ H05B *3/68*
U.S. Cl. 219—463 **6 Claims**



1. A heating assembly primarily designed to mount and undersized heating coil in a standard sized surface aperture and cooking surface of an electric stove, said assembly comprising:

(a) an adaptor ring adapted for use in combination with a drip pan mounted within the surface aperture, the drip pan including a bowl and a flange portion respectively disposed below and above the cooking surface in which the surface aperture is formed, said flange portion connected

to the bowl and disposed in surrounding outwardly extending relation to an upper portion of the bowl,

(b) said adaptor ring and the drip pan being formed from a heat resistant material,

(c) the heating element mounted on said adaptor ring and comprising an undersized heating coil centered within said adaptor ring and including a diameter having a dimension a predetermined amount less than the diameter of the surface aperture in which said heating coil is positioned,

(d) said adaptor ring removably mounted on the drip pan means and including a peripheral flange disposed adjacent to and substantially defining an extension of the flange portion, said peripheral flange further disposed in surrounding, spaced apart and adjacent relation to an outer periphery of said undersized heating coil,

(e) said peripheral flange structured to include a transverse dimension sufficient to extend from the flange portion to said outer periphery of said undersized heating coil and substantially overlaying collectively with the flange portion, a majority of the distance between said outer periphery and a correspondingly disposed periphery of the surface aperture,

(f) said undersized heating coil comprising two free ends integrally secured to opposite ends of said heating coil and each including correspondingly disposed extremities structured for interconnection to an electrical power supply, said free ends being longitudinally dimensioned for centering of said heating coil within said adaptor ring,

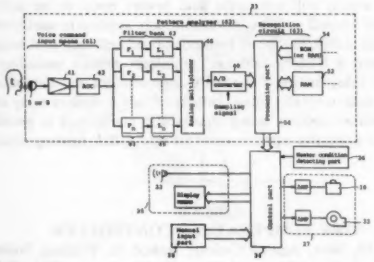
(g) at least one of said free ends having an extended longitudinal dimension being at least 30% of the radius of the surface aperture, whereby said undersized heating coil is substituted for a conventionally sized heating coil of a diameter substantially corresponding to the size of the surface aperture.

4,506,142

VOICE ACTUATED HEATING APPARATUS

Teruhisa Takano, Osaka, and Shigeki Ueda, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 217,651, Dec. 18, 1980, Pat. No. 4,340,797. This application Jun. 17, 1982, Ser. No. 389,490
Claims priority, application Japan, Dec. 21, 1979, 54-167404
The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.
Int. Cl.³ H05B 6/68
U.S. Cl. 219—490 **3 Claims**



1. In a voice-command heating apparatus including a heating element, a voice command circuit for detecting a user's voice command, a control circuit for controlling the heating apparatus in response to a detected voice command, and a control panel provided with at least a start key adapted to be operated by a user, the improvement comprising:

means for storing data corresponding to a plurality of heating level and corresponding heating time values, and a plurality of preprogrammed cooking sequences, each sequence for automatically controlling cooking in response to a measured parameter indicative of the progress of the cooking sequence; and

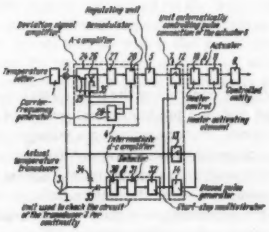
wherein the voice command circuit identifies a first voice command and selects one of said cooking sequences, previously stored, to be executed, the voice command circuit including means for enabling an interactive communication between the apparatus and the user and requiring a communication from the user confirming a second voice command previously given for starting a cooking sequence.

4,506,143

AUTOMATIC TEMPERATURE CONTROL DEVICE

Alexandr I. Telis; Pavel P. Epishin; Viktor I. Korzhov; Gennady A. Makarov; Iosif Y. Kotlyarenko, all of Odessa, and Nikolai V. Grischenko, Kirovogradskaya, all of U.S.S.R., assignors to Ukrainsky Nauchno-Issledovatelsky Institut Stankov I Instrumentov, Odessa, U.S.S.R.

PCT No. PCT/SU80/00127, § 371 Date Mar. 15, 1982, § 102(e) Date Mar. 15, 1982, PCT Pub. No. WO82/00534, PCT Pub. Date Feb. 18, 1982
PCT Filed Jul. 31, 1980, Ser. No. 361,915
Int. Cl.³ H05B 1/02
U.S. Cl. 219—497 **5 Claims**



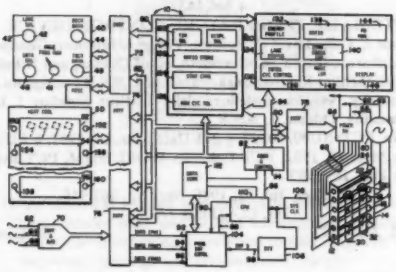
1. An automatic temperature control device comprising series-connected components including a temperature setter (1) of a controlled entity (9), a comparison unit (2) whose second input is connected to an actual temperature transducer (3) of the controlled entity (9), a deviation signal amplifier (4), and a regulating unit (5) furnishing a signal functionally dependent on the deviation signal, the output of said unit being electrically coupled to the input of the actuator (6), and also a unit (8) used to check the circuit of the transducer (3) for continuity, a unit (7) automatically controlling pulse connection of the actuator (6) when the circuit of the transducer (3) is open, said unit being provided with a main electronic switch (12) having its control input connected to the output of the unit (8) used to check the circuit of the transducer (3) for continuity, and operating to apply to the input of the actuator (6) a periodic pulse sequence fed while the circuit of the transducer (3) is open and affecting control to maintain an intermediate temperature in the controlled entity (9) within the operating temperature range, said unit (8) used to check the circuit of the transducer (3) for continuity representing a periodic pulse sequence generator triggered when the circuit of the transducer (3) is open, while the unit (7) automatically controlling pulse connection of the actuator (6) when the circuit of the transducer (3) is broken incorporates an additional electronic switch (13) whose output is connected to a second input of the comparison unit (2), and a biased pulse generator (14) triggered by the trailing edge of an input pulse and having an input connected to the output of the check unit (8) and an output coupled to the control input of the additional electronic switch (13), the input of the actuator (6) being electrically coupled to the output of a regulating unit (5) through said main electronic switch (12) of the automatic control unit (7).

4,506,144

CONTROL FOR RADIANT HEATING

Frank W. Hesford; Jerome L. Lampe, both of Cincinnati, and Paul Szekely, Mainville, all of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jul. 19, 1982, Ser. No. 399,852
Int. Cl.[3] H05B 1/02
U.S. Cl. 219—497 7 Claims



1. Apparatus for controlling the total electrical energy delivered to a load during a predetermined period of time from an alternating current source producing a voltage subject to variations from a nominal value, the apparatus comprising:

(a) means for producing a minimum voltage signal representing the minimum value the source voltage can reach;

(b) means for producing an actual voltage signal representing the actual value of the source voltage;

(c) means for producing a duty cycle signal representing a ratio of the square of the minimum voltage signal to the square of the actual voltage signal; and

(d) means responsive to the duty cycle signal for selectively applying cycles of the source voltage to the load to conform the actual energy delivered to the load during the predetermined period to a value predicted from the minimum voltage value and also includes means for proportioning the number of total cycles to be applied to the load so as to distribute the applied cycles in time during the period further comprising

(i) means for producing an applied cycle signal representing the number of cycles of the source voltage applied to the load during the period;

(ii) means for producing a total cycle signal representing the number of total cycles produced by the source during the period including a cycle just commencing;

(iii) means responsive to the duty cycle signal, the applied cycle signal, and the total cycle signal for producing a first duty cycle error signal representing the difference between the duty cycle signal and the ratio of applied cycles to total cycles;

(iv) means responsive to the duty cycle signal, the applied cycle signal and the total cycle signal for producing a second duty cycle error signal representing the difference between the duty cycle signal and the ratio of applied cycles including the cycle just commencing to the total number of cycles; and

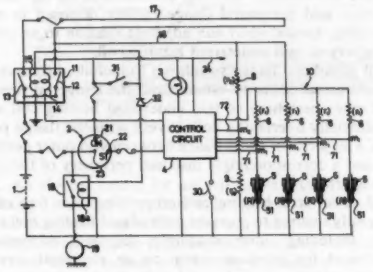
(v) means responsive to the first and second duty cycle error signals for selectively applying or withholding the just commencing cycle to the load in accordance with the lesser of the duty cycle error signals.

4,506,145

DEVICE FOR CONTROLLING ENGINE PREHEATING

Hideo Kawamura; Isamu Otsubo, and Tsutomu Kitagawa, all of Kanagawa, Japan, assignors to Isuzu Motors Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 400,525, Jul. 21, 1982, abandoned, which is a continuation of Ser. No. 51,289, Jun. 22, 1979, abandoned. This application Dec. 6, 1982, Ser. No. 447,370
Claims priority, application Japan, Jul. 10, 1978, 53/83731
Int. Cl.[3] H05B 1/02
U.S. Cl. 219—499 8 Claims



1. An apparatus for controlling the preheating of a diesel engine, comprising: at least one preheating plug having a heater body having a resistance variable with temperature at least in the vicinity of predetermined upper and lower preheating temperatures, said resistance of said heater body being sufficiently small that said heater body would melt if a predetermined rated voltage were continuously applied to said heater body; means for detecting when said heater body reaches said predetermined upper temperature, said detecting means including a bridge circuit having an arm in which said heater body is interposed and a control circuit including a comparator for comparing voltages of said bridge circuit; quick heating circuit means for applying, in an accessory energizing position of a starter switch, said rated voltage to said heater body when an output of said detecting means indicates that the temperature of said heater body is below said predetermined upper temperature, said quick heating circuit having a relay having a normally open contact disposed between a battery and said bridge circuit; and stabilizer circuit means for applying to said heater body, when said starter switch is in an engine starting position, a second voltage lower than said rated voltage which will not cause said heater body to be melted when said second voltage is continuously applied to said heater body, said stabilizer circuit being disposed between said bridge circuit and a battery and said stabilizer circuit including a stabilizer relay having a normally open contact and a stabilizer resistor, said normally open contact of said stabilizer relay and said stabilizer resistor being electrically connected in parallel with said normally open contact of said quick heating circuit means.

4,506,146

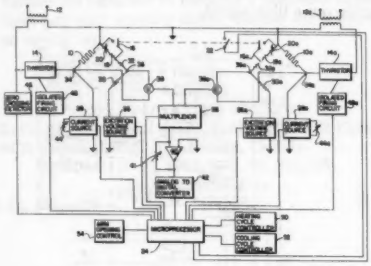
WIRE TEMPERATURE CONTROLLER

Richard M. Rice, Agusta County; Robert E. Watling, Nelson County, both of Va., and Drew R. Henderson, Ridgefield, Conn., assignors to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 294,919, Aug. 21, 1981, abandoned. This application Feb. 21, 1984, Ser. No. 581,603
Int. Cl.[3] H05B 1/02
U.S. Cl. 219—499 7 Claims

1. An apparatus for controlling the temperature of an electrically heated wire comprising an alternating current voltage power supply in a circuit with said wire, said circuit compris-

ing a zero crossing detector for determining each zero crossing of said alternating current voltage power supply, a bridge circuit containing said wire, means for electrically exciting said bridge circuit in response to each zero crossing of said alternating current voltage power supply, said means for electrically exciting comprising a voltage supply for a high impedance side of said bridge circuit and a current supply of opposite polarity to said voltage supply for a low impedance side of said bridge circuit, means for measuring the voltage at a pair of detector



corners of said bridge circuit comprising a summing junction, a thyristor and a firing circuit for said thyristor for electrically connecting said wire and said alternating current voltage power supply in response to the summed voltage of said detector corners of said bridge circuit and a microprocessor for controlling said means for exciting in response to each zero crossing of said alternating current voltage supply and for controlling said firing circuit and said thyristor in response to the summed voltage of said detector corners of said bridge circuit.

4,506,147

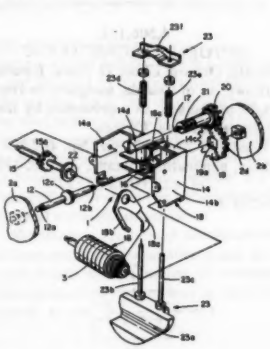
HUBODOMETER ADAPTED FOR SELECTABLE GEAR RATIOS

Patrick L. Powell, Franklin Park, Ill., assignor to Standard Car Truck Company, Park Ridge, Ill.

Filed Mar. 14, 1984, Ser. No. 589,236

Int. Cl.³ G01C *22/00*

U.S. Cl. 235—95 B **13 Claims**



7. In a hubodometer having a housing adapted for coupling to a rotating object so as to rotate with that object, a weighted frame located within the housing and pivoted relative the housing so as to be independent of the housing rotation, an odometer register supported on the frame and having a plurality of sequentially stepped register wheels actuated by a pawl driven ratchet wheel in which a drive pawl has an elongated tongue-like body which is pivoted generally at one end of the body and which has a pointed tooth at the opposite end of the body engaging the interdental notches located between the peripheral teeth of the ratchet wheel to drive the ratchet wheel, the improvement comprising an arcuate and elongated pawl restraining arm forcing the drive pawl into engagement with the ratchet wheel with the restraining arm being integrally and resiliently attached to the pivoted end of the drive pawl, a pawl restraining pin integrally attached to the end of the pawl restraining arm opposite the end attached to the drive pawl and with the pin lodged to move within a slot formed in the frame, an odometer ratchet stop wheel fixed to the pawl driven ratchet wheel, and an elongated stop pawl having an elongated finger resiliently attached to the frame with the projecting finger engaging the interdental notches located between the peripheral teeth of the ratchet stop wheel, and gear means coupled to the housing and the drive pawl to step pivot the drive pawl in response to the relative rotation of the housing with respect to the frame whereby as the pawl driven ratchet wheel is advanced by the drive pawl and the drive pawl is pivoted to engage the next adjacent interdental space the stop pawl engages an interdental notch of the ratchet stop wheel so that the odometer ratchet wheel is locked in place and does not reverse as the drive pawl is pivoted from one notch to the next adjacent notch of the ratchet wheel.

8. In a hubodometer having a housing adapted for coupling to a rotating object so as to rotate with that object, a weighted frame located within the housing and pivoted relative the housing so as to be independent of the housing rotation, a gear driven odometer register supported on the frame and having a plurality of register wheels sequentially stepped by a pawl driven ratchet wheel and in which the pawl driven ratchet wheel is driven by an odometer drive gear which is shaft mounted on the hubodometer frame transversely to the axis of rotation of the hubodometer, the improvement relating to increasing the range of selectable gear ratios for the hubodometer comprising gear means supported at least in part by the hubodometer frame with the gear means coupled to the housing and the pawl driven ratchet wheel to step pivot the ratchet wheel in response to the relative rotation of the housing with respect to the frame and with the hubodometer frame receiving alternatively either at least a part of a first gear train having a first gear ratio to engage the odometer drive gear at a first locus of gear engagement, or at least a part of a second gear train having a second gear ratio to engage the odometer drive gear at a second locus of gear engagement.

4,506,148

IDENTIFICATION CARD

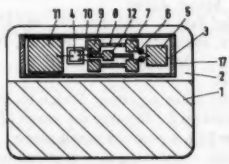
Rainer Berthold, Gaiberg, and Rainer Strietzel, Heidelberg, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 439,298

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143915

Int. Cl.³ G06K *5/00*

U.S. Cl. 235—380 **7 Claims**



1. Identification card, comprising a card body, an integrated semiconductor circuit being mechanically inserted and protected in said card body for storing data to be read-out and read-in in changed form, receiving antenna means, a rectifier circuit connected to said receiving antenna means, a filter circuit connected between said rectifier circuit and said inte-

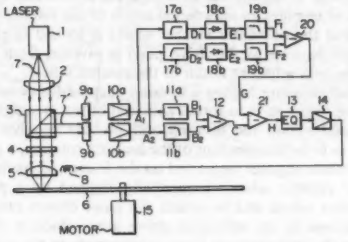
grated semiconductor circuit, said rectifier and filter circuits generating a supply voltage for said integrated semiconductor circuit from an energy field, a microwave transmitting antenna connected to said integrated semiconductor circuit, and a transmitter connected to said transmitting antenna.

4,506,149

TRACKING SERVO SIGNAL GENERATING DEVICE IN AN APPARATUS FOR READING RECORDED INFORMATION

Yoshihiro Utsumi, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,792
Claims priority, application Japan, Oct. 27, 1981, 56-171881
Int. Cl.³ G05B *1/00*
U.S. Cl. 250—202 **2 Claims**



1. An apparatus for generating a tracking servo signal in a tracking servo control system in a recorded information reading apparatus adapted to deviate an information detecting point in the direction perpendicular to a target recording track on a recording medium in accordance with said tracking servo signal so that the information detecting point accurately traces the recording track, comprising:

detecting means for producing a pair of detection signals a difference between which represents amount and directions of deviations of said information detecting point from the track in the direction perpendicular to the track;

means for obtaining a first difference between low-frequency components of the detection signals of said detecting means;

means for obtaining a second difference between levels of high-frequency components of the detection signals of said detecting means; and

means for generating said tracking servo signal by combining said first and second differences.

4,506,150

AUTOMATIC FOCUS ADJUSTING DEVICE WITH A BRIGHTNESS DEPENDENT LENS DRIVE SIGNAL

Akira Ogasawara, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 4, 1983, Ser. No. 463,676
Claims priority, application Japan, Feb. 19, 1982, 57-24555
Int. Cl.³ G03B *3/10*
U.S. Cl. 250—204 **10 Claims**

1. An automatic focus adjusting device including:

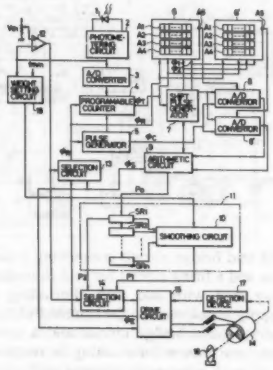
(a) an optical system for forming the image of an object to be photographed on a predetermined plane;

(b) photoelectric converting means including a plurality of photoelectric elements for accumulating therein a charge corresponding to the quantity of light from said object, said photoelectric converting means being capable of producing with lapse of time an output indicative of the state of the image of said object on said predetermined plane;

(c) means for controlling the charge accumulating time of said photoelectric elements in accordance with the brightness of said object;

(d) position detecting means for detecting the positional relation between the image of said object and said predetermined plane in accordance with the output of said photoelectric converting means and producing a position signal indicative of said positional relation each time said photoelectric converting means produces an output;

(e) filter means for receiving said position signal as input, modifying the newest position signal of said input position signal on the basis of at least one past position signal and putting out a filter signal;



(f) brightness detecting means for detecting the brightness of said object and putting out a brightness signal when the brightness of said object is lower than a predetermined value;

(g) selecting means for selecting and putting out one of said position signal and said filter signal in accordance with said brightness signal; and

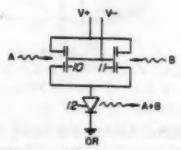
(h) means for driving said optical system in a direction in which the image of said object is formed on said predetermined plane, in accordance with the output of said selecting means.

4,506,151

OPTOELECTRONIC LOGIC

R. Ian MacDonald, Ottawa; Elmer H. Hara, Kanata, and Robert H. Hum, Ottawa, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jul. 27, 1982, Ser. No. 402,394
Claims priority, application Canada, Jul. 30, 1981, 382915
Int. Cl.³ H01J *31/50*
U.S. Cl. 250—213 A **13 Claims**



1. An optoelectronic logic circuit, comprising:

photosensitive means for detecting at least one optical input which varies the conductance of said photosensitive means;

light emitting means for providing an optical output repre-

senting a predetermined logic condition in response to a predetermined operating current dependent upon the varying conductance of said photosensitive means;

conductor means interconnecting said photosensitive means and said light emitting means for applying said operating current to said light emitting means to provide said optical output;

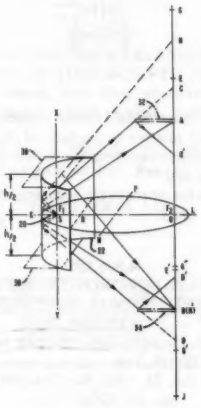
and bias means maintaining a threshold operating current through said light emitting means, said threshold operating current being less than said predetermined operating current but sufficient to maintain a minimum light output from said light emitting means without the occurrence of an optical input.

4,506,152

ILLUMINATION SYSTEM

Bal K. Gupta, Waterloo, Canada, assignor to NCR Canada Ltd. - NCR Canada LTEE, Mississauga, Canada

Filed Jul. 12, 1982, Ser. No. 397,335
Int. Cl.³ H01J 3/14
U.S. Cl. 250—216 **21 Claims**



1. An illumination system for illuminating an object, comprising:

an elliptical cylindrical mirror;

an illumination source positioned on a first focal line of the mirror and focused to provide illumination of said object along the second focal line of the mirror;

first and second mirror means positioned in first and second parallel planes, respectively, which are located adjacent to opposite boundaries of the object to be illuminated; and

third and fourth mirror means, which are positioned to constitute end elements of the cylindrical surface defining said elliptical cylindrical mirror;

whereby illumination from said illumination source is reflected from said cylindrical mirror and said first, second, third and fourth mirror means to increase the relative illumination adjacent to the boundaries of the object to be illuminated.

4,506,153

PROCESS SIGNAL COLLECTING APPARATUS

Nobuo Ohno, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1982, Ser. No. 370,243
Claims priority, application Japan, Apr. 29, 1981, 56-66083
Int. Cl.³ G02B 5/14
U.S. Cl. 250—227 **8 Claims**

1. A process signal collecting apparatus for collecting signals associated with a process control, comprising:

light transmission path means,

a plurality of light transmission branch means coupled to said light transmission path means,

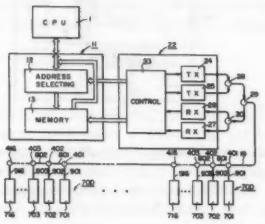
light transmitting means coupled to said light transmission path means for transmitting a light pulse to said light transmission path means and said plurality of light transmission branch means,

a plurality of optical switch means coupled to said plurality of light transmission branch means for reflecting said light pulse from said light transmitting means when said optical switch means assume a first state and for differentiating the reflection state of said light pulse from said light transmitting means when said optical switch means assume a second state which is different from said first state,

light receiving means coupled to said light transmission path means for detecting said differentiation of the reflection state of said light pulse at said optical switch means

the total length of the light transmission from said light transmitting means through said light transmission path means and said light transmission branch means to each of said optical switch means and back therefrom through said light transmission branch means and said light transmission path means to said light receiving means being selected to be different from each other for each said optical switch means for uniquely identifying each said optical switch means by said total length of the light transmission,

determining means responsive to the deteced output signal from said light receiving means for detecting said first state or second state being assumed by each of said plurality of optical switch means,



said determining means comprising

data providing means responsive to the outputs from said light receiving means for providing the data concerning said first state or said second state of each of said plurality of optical switch means in terms of respective time differences, each corresponding to said total length of the light transmission selected to be different for each said optical switch means, for uniquely identifying each said optical switch means, and

timing pulse generating means for generating a timing pulse corresponding to each said time difference,

storage means responsive to said determination by said determining means for storing the data concerning said determination of said first state or said second state being assumed by each of said plurality of optical switch means, and

process control means responsive to said data concerning said determination of said first state or said second state being assumed by each of said plurality of optical switch means stored in said storage means,

said light transmitting means comprising first light transmitting means for transmitting a light pulse of a first wavelength, and

second light transmitting means for transmitting a light pulse of a second wavelentgh, said apparatus further comprising

light composing means for coupling said first and second light transmitting means to said light transmission path means for transmitting said light pulse of said first wavelength from said first light transmitting means and said

light pulse of said second wavelength from said second light transmitting means to said light transmission path means in a combined manner, and wherein

each said optical switch means comprises

first light reflecting means for reflecting at least said light pulse of said first wavelength in response to said first state of said optical switch means, and

second light reflecting means for reflecting said light pulse of said second wavelength in response to said second state of said optical switch means, and wherein

said light receiving means comprises

first light receiving means for receiving said light pulse of said first wavelength reflected by said first light reflecting means, and

second light receiving means for receiving said light pulse of said second wavelength reflected by said second light reflecting means.

4,506,154

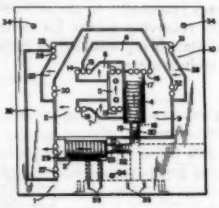
PLANAR BIAXIAL MICROPOSITIONING STAGE

Fredric E. Scire, 5319 Wye Creek Dr., Frederick, Md. 21701

Filed Oct. 22, 1982, Ser. No. 436,055

Int. Cl.³ G21K *5/10*

U.S. Cl. 250—442.1 **12 Claims**



1. A micropositioning stage comprising a first structure mounted coplanar with and concentrically within a second structure, said first structure comprising a first frame and within said first frame platform means for holding a specimen and moving it in a linear first direction, said platform means being mounted between two arm means each pivotally attached to said first frame for causing said movement in response to displacement of one of said arm means by a third pivotal arm means also pivotally attached to said first frame for producing said displacement in response to initial displacement by first means for producing a linear force thereon in said first direction; said second structure comprising a second frame enclosing the first structure and two additional pivot arm means each pivotally attached to said second frame on either side of said first structure for causing movement thereof in a second direction relative to the first direction and in response to displacement of one of said additional pivot arm means by an additional third pivot arm means also pivotally attached to said second frame for producing said displacement in response to initial displacement by second means for porducing a linear force in said second direction.

4,506,155

METHOD AND APPARATUS USABLE WITH A CALIBRATION DEVICE FOR MEASURING THE RADIOACTIVITY OF A SAMPLE

Arata Suzuki, Ramsey, N.J., and William D. Allardice, Jr., Pittsburgh, Pa., assignors to Capintec, Inc., Ramsey, N.J.

Filed Sep. 21, 1982, Ser. No. 420,636

Int. Cl.³ G01D *18/00*

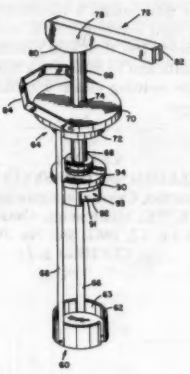
U.S. Cl. 250—252.1 **14 Claims**

1. A handling apparatus for carrying an assembled cannister shielding a container, the cannister having a cannister body and a base supporting the container, the base being releasably engaged with the cannister body, said handling apparatus comprising:

chuck means for holding the base of the cannister;

a cover member spaced from said chuck means;

frame means coupling said cover member to said chuck means for guiding the movement of the cannister body;



lifting means located in said cover member for moving the cannister body relative to the base of the cannister within the space defined between the cover member and said chuck means; and

engaging means for operatively securing the lifting means to the cannister body.

4,506,156

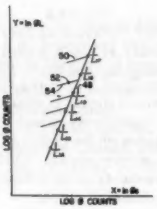
EARTH FORMATION POROSITY DETERMINATION WITH DUAL EPITHERMAL NEUTRON DETECTOR SYSTEM

Marcel L. Mougne, Houston, Tex., assignor to Gearhart Industries, Inc., Fort Worth, Tex.

Filed Jul. 31, 1981, Ser. No. 288,792

Int. Cl.³ G01V *5/10*

U.S. Cl. 250—266 **6 Claims**



1. A method of determining the porosity of earth formations surrounding a wellbore shielded by well casing and cement, comprising:

producing fast neutrons in a wellbore from a neutron source;

detecting a first epithermal neutron population resulting from passage of neutrons from said source through a designated first region disposed adjacent to said wellbore, said first region including at least a thickness of said well casing and said cement;

detecting a second epithermal neutron population resulting from passage of neutrons from said source through a designated second region disposed adjacent to said wellbore, said second region also including said well casing and said cement;

determining the relationship between the logarithm of a first

detected epithermal neutron population resulting from passage of neutrons from said source through a designated first region of a plurality of known porosity homogenous mediums and the logarithm of a second detected epithermal neutron population resulting from passage of neutrons from said source through a designated second region of a plurality of known porosity homogenous mediums;

plotting said relationship as a first curve, each point of which represents a unique value of porosity;

plotting a second curve comprising the logarithm of said first detected epithermal neutron population resulting from passage of neutrons from said source through said designated first region disposed adjacent to said wellbore versus the logarithm of said second detected epithermal neutron population resulting from passage of neutrons from said source through said designated second region disposed adjacent to said wellbore; and

correcting individual points on said second curve to corresponding points on said first curve utilizing known attenuating factors for said well casing and said cement wherein the porosity of said earth formation at that point may be determined.

4,506,157

THERMOLUMINESCENCE DOSIMETER TAKING ACCOUNT OF TISSUE DEPTH OF DOSE

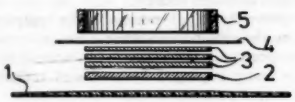
Manfred Keller, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Jan. 4, 1982, Ser. No. 336,611

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1981, 3100868

Int. Cl.³ G01T *1/00*

U.S. Cl. 250—337 **11 Claims**



1. A thermoluminescence dosimeter for measuring radiation doses in dependence on living tissue depth, with a capability of measuring the equivalent dose at a tissue depth of 70 um corresponding to a weight of tissue per surface area of 7 mg/cm^2, comprising the combination of a thin cover having a weight per unit area substantially less than 4 mg/cm^2 capable of serving as a β-ray window and at least two thermoluminescence dosimeter disks of equal area stacked adjacent thereto including a thermoluminescence dosimeter disk having a weight per unit area in the range from 15 to 30 mg/cm^2 which is located immediately adjacent to said β-window cover and a second disk having a weight per unit area exceeding 30 mg/cm^2.

4,506,158

DUAL MODE SPECTROMETER TEST STATION

Robert H. Cadwallader, Poughkeepsie; Harold D. Edmonds, Hopewell Junction, and Murlidhar V. Kulkarni, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,927

Int. Cl.³ G01J *1/00*

U.S. Cl. 250—338 **6 Claims**

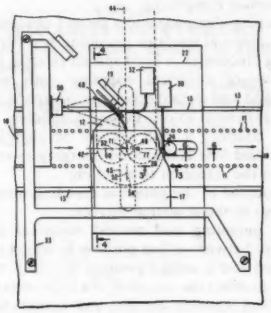
1. In a spectrographic analysis system for analyzing semiconductor wafers, an automated wafer handling and measurement system comprising:

first and second wafer storage means for respectively storing a plurality of wafers before and after measurement, said first and second storage means being spaced apart,

conveying means for transporting wafers serially along a path extending from said first storage means to said second storage means, said path including a measurement station;

means for directing measurement radiation on a spot in said measurement station where it will impinge on the wafer and cause some of the radiation to be reflected from the wafer and some of the radiation to pass through the wafer;

rotation and translation carriage means within said station to both rotate said wafer and translate said wafer at right



angles to said path in said station to place a plurality of both radially and circumferentially displaced points on said wafer in said spot;

means respective to the radiation reflected from the wafer to determine the thickness of an epitaxial layer in the wafer; and

means responsive to the radiation transmitted through the wafer to determine the carbon and/or oxygen content of the wafer.

4,506,159

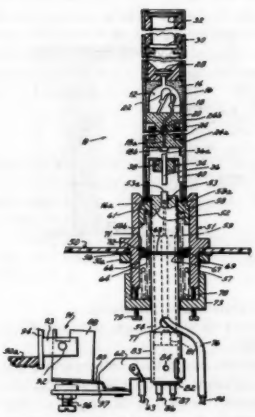
DOSIMETER CHARGING APPARATUS

Frederick A. Reuter, and Charles J. Moorman, both of Cincinnati, Ohio, assignors to Dosimeter Corporation of America, Cincinnati, Ohio

Filed Aug. 10, 1983, Ser. No. 522,038

Int. Cl.³ G01T *1/18*

U.S. Cl. 250—377 **11 Claims**



1. Apparatus for charging a dosimeter having a capacitor connected between first and second relatively stationary dosimeter electrodes, an ionization chamber exposed to at least portions of said first and second electrodes to discharge said capacitor when ionizing radiation penetrates said chamber, a

movable electrode electrically connected to said first electrode which deflects varying amounts depending upon the charge present on said capacitor, a first movable electrical contact shiftable between a non-charging position spaced from said first electrode and a charging position contacting said first electrode, and a first electrical insulator mounting said movable contact and maintaining said movable contact and said second electrode in spaced relation when said movable contact is in its charging and non-charging positions, said dosimeter charger apparatus comprising:

a first charging electrode and a second charging electrode;

a second, electrical insulator mounting said first and second charging electrodes in fixed spaced relation to each other susceptive of electrical coupling with said movable contact and said second dosimeter electrode, respectively, when it is desired to charge said dosimeter;

means for coupling a high voltage dc charging potential between said first and second charging electrodes in response to the actuation of a switch;

a switch coupled to the potential coupling means, which is responsive to the actuation thereof;

means for mounting said second electrical insulator for movement between a first position in which the switch is deactuated and a second position in which the switch is actuated to effect the coupling of a high voltage dc charging potential between said first and second charging electrodes; and

means for yieldably resisting the movement of the second insulator past said second, switch actuating, position after said movable electrical contact in the dosimeter has shifted to its charging position contacting said first electrode, the first charging electrode being in contact with said movable contact of the dosimeter.

4,506,160

ION SOURCE APPARATUS

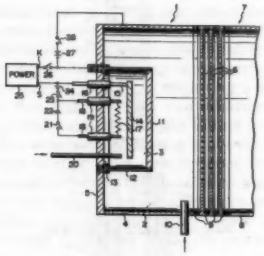
Toru Sugawara, Fujisawa, and Yasuyuki Ito, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 17, 1983, Ser. No. 495,536

Claims priority, application Japan, May 24, 1982, 57-86562; Jun. 8, 1982, 57-96942

Int. Cl.³ H01J *27/00*

U.S. Cl. 250—427 **13 Claims**



1. An ion source apparatus comprising:

a discharge chamber to which a gas is supplied;

a cathode chamber;

a thermionic cathode interposed between and partitioning the discharge chamber and the cathode chamber;

an auxiliary electrode which is arranged in the cathode chamber and which is adapted to produce emission current and/or electron current between the thermionic cathode and the auxiliary electrode;

a power source unit for supplying an A.C. voltage between the thermionic cathode and the auxiliary electrode such that effective power for keeping the thermionic cathode at a positive potential with respect to the auxiliary electrode is higher than that for keeping said auxiliary electrode at a positive potential with respect to the thermionic cathode; and

an anode which causes a gas discharge between the anode and the thermionic cathode heated by discharge and/or electron bombardment between the thermionic cathode and the auxiliary electrode in the discharge chamber, thereby ionizing the gas.

4,506,161

SMOKE DETECTOR WITH A RADIATION SOURCE OPERATED IN A PULSE-LIKE OR INTERMITTENT MODE

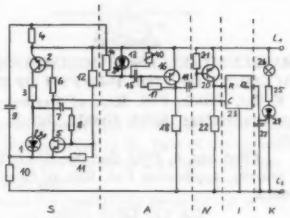
Jürg Muggli, and Heinz Güttinger, both of Männedorf, Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Jun. 8, 1982, Ser. No. 386,247

Claims priority, application Switzerland, Jun. 15, 1981, 3926/81

Int. Cl.³ G01H *15/06*

U.S. Cl. 250—574 **14 Claims**



1. A smoke detector comprising:

a pulse-operated radiation source;

a radiation receiver arranged externally of a region directly irradiated by the radiation source;

said radiation receiver in the presence of smoke in the radiation region being impinged by scattered radiation and delivering output pulses;

an evaluation circuit containing switching elements;

a switching stage operatively connected with said switching elements;

said switching elements, when said output pulses exceed a predetermined threshold during a predetermined number of pulses, delivering a signal to said switching stage for the purpose of delivering an alarm signal;

means for generating electrical blocking pulses;

a counter;

means for infeeding, by virtue of the difference between said blocking pulses and said output pulses of the radiation receiver, a reset signal to the counter; and

means for further switching the counter upon the absence of the reset signal and, upon obtaining a predetermined counter state of the counter, further conducting the signal to the switching stage.

4,506,162

STARTER FOR AN INTERNAL COMBUSTION ENGINE

Klaus Bolenz, and Franz Liedl, both of Schwieberdingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,892

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216448

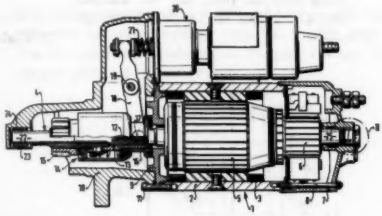
Int. Cl.³ F02N *15/00, 15/06*

U.S. Cl. 290—38 A **13 Claims**

1. Starter structure, for an internal combustion engine having a dynamo electric machine, including

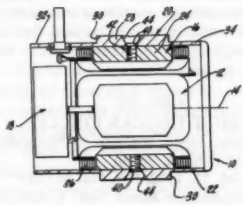
a stator (3) and a rotor (4,5,6) and housing (2,7,10), said housing having an outside surface;

the rotor including a rotor assembly, including a rotor shaft (4), an armature (5) and a commutator (6), both secured to the shaft (4);
a drive pinion (15) rotatably supported on the shaft (4);
connection means (14) for selectively coupling the shaft in the drive pinion;
control means (16-21) for selectively engaging the connection means (14) and the shaft (4);
bearings (23, 26) supported in respective bearing housing portions (10, 7) and journaling respective end portions (22,25) of the shaft; and means for controlling the longitudinal position and play of the shaft (4) in the bearings (23,26),
comprising, in accordance with the invention,



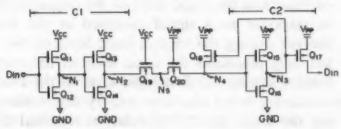
an axial play compensation adjustment plug (29), having an abutment surface (31) facing the outside of one of the bearing housings (7,10), and releasably fitted on the housing adjacent a bearing (23,26) and in axial alignment therewith;
an engagement surface (32) formed on the bearing housing (7,10) and facing outwardly of the housing (7,10), and being engaged by the abutment surface (31) on the adjustment plug (29) with respect to the bearings; and
an axial play compensation spacer (35, 35*a*, 35*b*) located between an end face (33) of the adjustment plug (29) and an end face (36) of the adjacent end portion (22, 25) of the shaft (4).

4,506,163
STARTER MOTOR HOUSING
Julius J. Stevens, Fort Deposit, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Apr. 21, 1983, Ser. No. 487,265
Int. Cl.³ F02N *11/00*
U.S. Cl. 290—38 R **5 Claims**



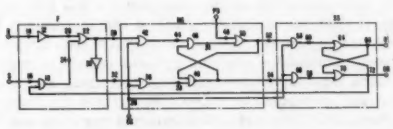
1. In a starter motor of the type having a tubular and cylindrical housing of a magnetic material, a rotor having a motor windings rotatably mounted within said housing, and a plurality of circumferentially and axially spaced stator windings rotatably mounted within said housing, and a plurality of circumferentially and axially spaced stator windings within the housing, the improvement comprising a radially thickened portion of said housing which forms a flux path between said axially spaced stator windings, said thickened portion having an axial length no greater than the axial spacing between said stator windings, said thickened portion having a radial thickness at least twice the thickness of the housing adjacent the thickened portion and said thickened portion being positioned in between said stator windings
whereby the overall weight of said housing is reduced while the thickened portion forms the flux path for the stator windings.

4,506,164
CMIS LEVEL SHIFT CIRCUIT
Mitsuo Higuchi, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Nov. 24, 1982, Ser. No. 444,482
Claims priority, application Japan, Nov. 26, 1981, 56-189442
Int. Cl.³ H03K *5/02, 17/16, 3/353, 17/10*
U.S. Cl. 307—264 **7 Claims**



1. A semiconductor device comprising:
first and second power supplies, said second power supply having a higher potential than said first power supply;
a first circuit, operatively connected to and driven by said first power supply, for generating an output which is substantially the same potential as that of said first power supply;
a second circuit, operatively connected to and driven by said second power supply, comprising at least one CMIS circuit having an input terminal and an output terminal;
a P-channel transistor having a source operatively connected to said second power supply, a drain operatively connected to said input terminal of said at least one CMIS circuit of said second circuit, and a gate operatively connected to said output terminal of said at least one CMIS circuit of said second circuit; and
first and second N-channel transistors operatively connected in series between said first circuit and said input terminal of said at least one CMIS circuit of said second circuit, said first N-channel transistor having a gate operatively connected to said first power supply and said second N-channel transistor having a gate operatively connected to said second power supply.

4,506,165
NOISE REJECTION SET-RESET FLIP-FLOP CIRCUITRY
Surender K. Gulati, Catasauqua, and Clayton E. Schneider, Jr., Bethlehem, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jun. 30, 1982, Ser. No. 393,764
Int. Cl.³ G11C *11/40;* **H03K** *17/16, 17/693*
U.S. Cl. 307—272 A **8 Claims**



1. Set-reset master-slave flip-flop circuitry comprising:
a master section having an output terminal coupled to an input terminal of a slave section;
a first circuitry output terminal being coupled to the slave section;

feedback circuit means having first and second input terminals which serve as circuitry set and reset input terminals, respectively, a third input terminal which is coupled to the first circuitry output terminal and serves as a feedback input terminal, and an output terminal which is coupled to an input terminal of the master section;

the feedback circuit means being characterized such that same results in the logic level of the circuitry output terminal being selectively maintained;

the master and slave sections both being designed to receive a clock signal which has two different logic levels;

the master section being characterized in that same modifies or maintains the logic level of the output terminal thereof in response to signals occurring at the input terminal thereof during a first logic level of the clock signal but only maintains the logic level of the output terminal thereof during the second logic level of the clock signal;

the slave section being characterized in that same modifies or maintains the logic level of the output terminal thereof in response to a signal received at the input terminal thereof during the second logic level of the clock signal but only maintains the logic level of the output terminal thereof during the first logic level of the clock signal;

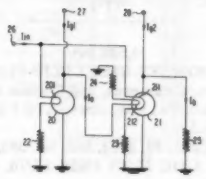
the circuitry being characterized by maintaining or modifying the logic level of the output terminal thereof in response to the logic levels applied to the set, reset, and feedback input terminals such that if the logicc level of the set or reset input terminals changes and then returns to the original logic level, then the logic level of the output terminal of the feedback circuit means assumes or maintains the logic level which resulted from the original logic level occurring at the set or reset input terminals such that the circuitry output terminal cannot change logic level unless a signal occurring at the set or reset input terminals maintains the second logic level during the time the clock signal makes a transition from one logic level to the other logic level.

4,506,166

PULSE GENERATION CIRCUIT USING AT LEAST ONE JOSEPHSON JUNCTION DEVICE

Junichi Sone, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,653
Claims priority, application Japan, May 25, 1981, 56-78966
Int. Cl.³ H03K *3/38, 5/04*
U.S. Cl. 307—277 **9 Claims**



1. A pulse generation circuit, comprising: a first gate circuit having at least one Josephson junction and including a first control current path, a second control current path connected to an input terminal for receiving a control current in response to a clock input applied to said input terminal, and a gate current path connected to a first gate terminal for receiving therefrom a DC current of a predetermined amplitude said first gate circuit making a transition from a zero-voltage state to a voltage state when a current of a predetermined amplitude flows through said second control current path in a predetermined direction;

a first resistor of predetermined resistance connected in parallel with said gate current path, the resistance of said first resistor being selected so that said first gate circuit operates in a non-latching mode; and

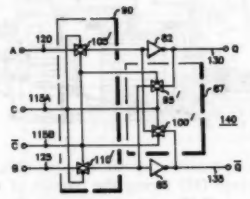
delay means for supplying to said first control current path, after a predetermined delay time, an opposite control current flowing in the opposite direction to the current flowing through said second control current path to thereby switch said first gate circuit back to said zero-voltage state.

4,506,167

HIGH SPEED LOGIC FLIP-FLOP LATCHING ARRANGEMENTS INCLUDING INPUT AND FEEDBACK PAIRS OF TRANSMISSION GATES

Wendell L. Little, Austin, Tex., and Barry W. Herold, Lauderhill, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 26, 1982, Ser. No. 469,541
Int. Cl.³ H03K *3/356, 23/30, 19/017*
U.S. Cl. 307—279 **25 Claims**



1. A logic latching device comprising:

first and second inverting means;

feedback switching means for selectively coupling the output of said first inverting means to the input of said second inverting means and the output of said second inverting means to the input of said first inverting means; and

input switching means for selectively providing first and second logic signals to the inputs of said first and second inverting means respectively, said input switching means and said feedback switching means operating in substantially complementary fashion, in that during a first time interval said input switching means are closed and said feedback switching means are open, and during a second time interval said input switching means are open and said feedback switching means are closed;

whereby, during the first time interval said first and second logic signals are provided to the inputs of said first and second inverting means, and during the second time interval outputs of said first and second inverting means are latched by said feedback switching means and said logic signals are no longer provided to said first and second inverting means.

4,506,168

SCHMITT TRIGGER CIRCUIT

Masaru Uya, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 12, 1982, Ser. No. 397,419
Claims priority, application Japan, Nov. 2, 1981, 56-176088
Int. Cl.³ H03K *5/153, 3/356*
U.S. Cl. 307—290 **6 Claims**

1. A Schmitt trigger circuit comprising:

a first transistor of a first conductivity type;

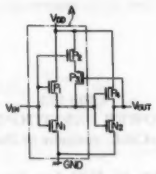
a series connection of second and third transistors of said first conductivity type;

a fourth transistor of a second conductivity type; and

an inverter;

a source of said first transistor and one end of said series connection being connected to a first voltage source, a source of said fourth transistor being connected to a second voltage source, drains of said first and fourth transis-

tors and the other end of said series connection being connected to an input terminal of said inverter, a gate of said third transistor being connected to an output terminal of said inverter, and gates of said first and second transistors being connected to a gate of said fourth transistor, whereby an input voltage supplied to the gate of said fourth transistor produces an output voltage from the output terminal of said inverter.

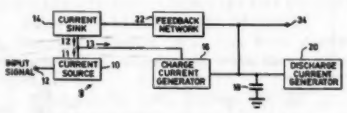


4,506,169

PEAK AMPLITUDE DETECTOR

William A. Cole, Putnam, Canada, assignor to Linear Technology Inc., Burlington, Canada

Filed Feb. 23, 1982, Ser. No. 351,567
Int. Cl.³ H03K *5/22, 5/153, 17/00*
U.S. Cl. 307—351 **12 Claims**



1. A device for producing a signal indicative of the peak magnitude of an alternating voltage signal, comprising:

current signal generating means responsive to the alternating voltage signal for generating a unipolar current signal having a peak in magnitude corresponding to each peak of a first polarity in the magnitude of the alternating voltage signal, each of the peaks in the magnitude of the current signal varying directly in magnitude with the corresponding peak in the alternating voltage signal;

transistor current sink means connected in series with said current signal generating means for sinking the unipolar current signal up to a controllable maximum current level;

charge current generating means for generating a charge current when the unipolar current signal exceeds the maximum current level;

a capacitor connected to the charge current generating means to receive the charge current;

feedback means responsive to the voltage drop across the capacitor for varying the maximum current level of the current sink means directly in magnitude with the voltage drop across the capacitor whereby the voltage drop across the capacitor tends to be indicative of the peak magnitude of the alternating voltage signal; and,

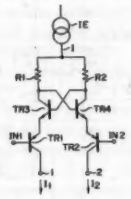
discharge current generating means for applying a substantially continuous discharge current to the capacitor so that the voltage drop across the capacitor can decrease in response to a decrease in the peak magnitude of the alternating voltage signal.

4,506,170

DIFFERENTIAL CURRENT DISTRIBUTING CIRCUIT

Yasuo Mizuide, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 8, 1983, Ser. No. 465,035
Claims priority, application Japan, Feb. 12, 1982, 57-20817
Int. Cl.³ H03K *17/04, 5/24, 3/26*
U.S. Cl. 307—355 **1 Claim**



1. A differential current distributing circuit comprising:

a constant current source;

a first current path including a first resistor, collector-emitter path of a first transistor of first conductivity type and emitter-collector path of a second transistor of second conductivity type which are connected in series between an output terminal of the constant current source and a first current output terminal; and

a second current path including a second resistor, a collector-emitter path of a third transistor of first conductivity type and emitter-collector path of a fourth transistor of second conductivity type which are connected in series between the output terminal of said constant current source and a second current output terminal,

in which the base electrode of said first transistor is connected to the output terminal of said second resistor, the base electrode of said third transistor is connected to the output terminal of said first resistor, a first input signal is supplied to the base electrode of said second transistor, a second input signal is supplied to the base electrode of said fourth transistor, and an output current of said constant current source is distributed into either of said first and second current paths according to a level difference between said first and second input signals.

4,506,171

LATCHING TYPE COMPARATOR

William P. Evans, Glen Burnie, Md.; Robert J. McCabe, Norristown, Pa., and Eric H. Naviasky, Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 29, 1982, Ser. No. 454,215
Int. Cl.³ H03K *5/08, 19/086*
U.S. Cl. 307—362 **10 Claims**

1. A latching type comparator operative in one state to generate at least one output signal in response to a comparison of a pair of input signals and operative in another state to secure the state of said output signal unresponsive to said comparison of the input signals, said comparator comprising:

an input stage governed by said pair of input signals to generate at least one intermediate current signal representative of the comparison of said input signals;

a first constant current stage for providing operational current continuously for the input stage;

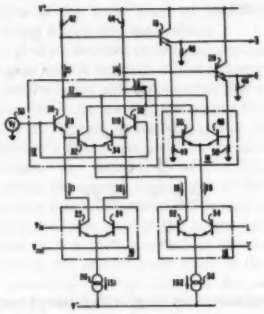
a gain stage selectively operative in response to said generated intermediate current signal to generate a drive current signal which is an amplification of said intermediate current signal;

a latch stage selectively operative to sustain said generated drive current signal according to the state of said output signal independent of said generated intermediate current signal;

a second constant current stage for providing a fixed amount of operational current which is independent of said first constant current stage;

a switching stage governed by at least one latch signal to operate between two mutually exclusive states, in one state said gain stage being rendered operative by conducting current between said gain stage and said second constant current stage and in said other state, said latch stage being rendered operative by conducting current between said latch stage and said second constant current stage; and

at least one buffer stage for buffering said drive current signal to generate said output signal.



4,506,172

DECODER CIRCUIT UTILIZING JOSEPHSON DEVICES

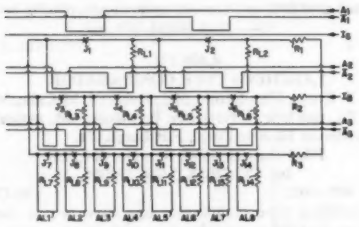
Shinya Hasuo, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 290,976, Aug. 7, 1981, abandoned. This application Jul. 23, 1984, Ser. No. 632,696

Claims priority, application Japan, Sep. 12, 1980, 55-126871; Sep. 12, 1980, 55-126872

Int. Cl.³ H03K *19/195*

U.S. Cl. 307—462 **20 Claims**



1. A decoder circuit, comprising

a plurality of sequentially connected stages,

2^n latch type Josephson devices in each nth one of said stages, wherein n varies from one to the number of said plurality of stages, and said Josephson devices of at least all but the first stage have a two-input AND function,

each said stage providing a plurality of output signals on a respective plurality of output lines, with each said output line being connected across a respective one of said Josephson devices of the same stage,

each said second and higher stage having as respective input signals to said Josephson devices thereof said output signals of the preceding stage, and

means for providing a bias current to each said Josephson device and the respective output line, and a respective address signal to each said Josephson device according to the decoding to be performed.

4,506,173

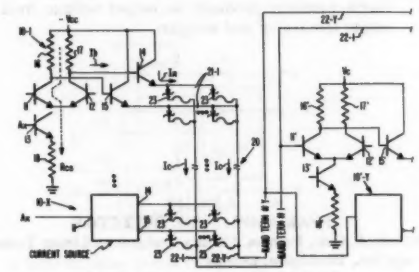
LOW POWER PARTITIONED PLA

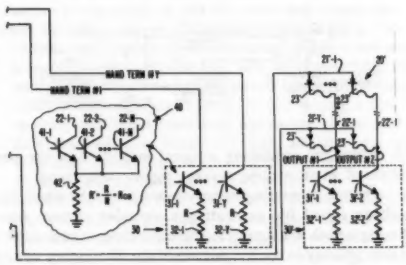
Daniel Yum, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 25, 1982, Ser. No. 436,374

Int. Cl.³ H03K *19/177, 19/013, 19/086*

U.S. Cl. 307—466 **12 Claims**



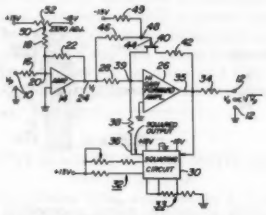


1. A logic array including a plurality of gated current source means for receiving respective input signals, each of said gated current source means being coupled to a respective row conductor and including means for sending current to said respective row conductor when the received input signal is in a predetermined state; said respective row conductors being partitioned into m groups where m is an integer greater than one; a respective high capacitance column conductor for each group of row conductors; respective coupling means connected between each group of row conductors and its high capacitance column conductor for selectively coupling current from the row conductors of each group to the high capacitance column conductor of the same group; a low capacitance column conductor; and m circuit means each of which is connected between a respective high capacitance column conductor and said low capacitance column conductor for generating current on said low capacitance column conductor whenever current from any of said row conductors is coupled by any of said coupling means to their corresponding high capacitance column conductor, and for isolating the respective capacitance of said high capacitance column conductors from each other.

4,506,174
SQUARE ROOT CIRCUIT WITH STABLE LINEAR CUT-OFF

James J. Hitt, Willow Grove, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed Nov. 12, 1982, Ser. No. 441,004
Int. Cl.[3] G06G 7/12, 7/20
U.S. Cl. 307—490 5 Claims



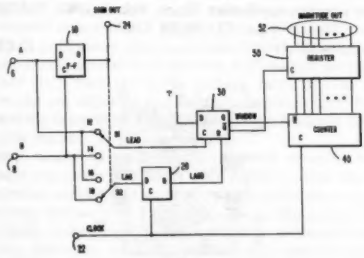
1. In a square root insertion circuit having a high gain amplifier for receiving an input signal and a squaring circuit in a negative feedback path for said amplifier to produce in the amplifier output a signal which is continuously the square root of said input signal and thus produces a large change in said amplifier output signal for small changes in said input signal in the region where said output signal is near zero, the improvement comprising:

another negative feedback path having a feedback resistor and switching means for selectively completing the connection of said another feedback path when said input falls below a certain level so that said circuit has a more linear characteristic when said input is below said certain level.

4,506,175
DIGITAL PHASE COMPARATOR CIRCUIT PRODUCING SIGN AND MAGNITUDE OUTPUTS

Glenn A. Reitmeier, Trenton, N.J., and Felix Aschwanden, Thalwil, Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Aug. 18, 1982, Ser. No. 408,143
Int. Cl.[3] H03K 19/094, 19/21
U.S. Cl. 307—525 4 Claims



1. Apparatus for comparing the phase of the transitions of first and second signals, said apparatus comprising:

a first flip-flop including first and second input terminals each of which is coupled for receiving one of said first and second signals, and also including an output terminal at which a phase direction signal is generated which is indicative of which of said first and second signals is a leading signal in which said transition is leading in phase, and which of said first and second signals is a lagging signal in which said transition is lagging in phase;

switch means having two input terminals coupled for receiving said first and second signals, first and second output terminals, and a control input terminl coupled to said output terminal of said first flip-flop for controlling said switch means in response to said phase direction signal, for coupling said first and second signals respectively to opposite ones of said first and second output terminals for providing said leading signal and said lagging signal, respectively, under control of said phase direction signal;

window signal generating means coupled to said first and second output terminals of said switch means for receiving said leading and lagging signals for initiating a window signal in response to the transition of said leading signal and terminating said window signal in response to said transition of said lagging signal;

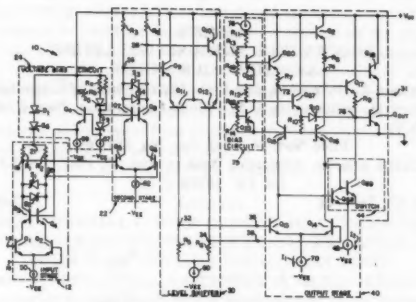
clock pulse generating means for generating clock pulses; and

counting means coupled to said window signal generating means and to said clock pulse generating means for counting said clock pulses during said window signal for generating a signal indicative of the magnitude of the phase difference between said transitions of said first and second signals.

4,506,176
COMPARATOR CIRCUIT

David J. Harris, San Jose, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed May 26, 1982, Ser. No. 382,279
Int. Cl.[3] H03K 5/08; G06G 7/12
U.S. Cl. 307—557 7 Claims



1. A circuit, comprising:

(a) an output transistor;

(b) means, responsive to an input signal for producing a voltage across a base and one of the collector and emitter electrodes of the output transistor, such voltage driving the output transistor to a conducting condition or a nonconducting condition selectively in accordance with the input signal;

(c) a current source;

(d) a second transistor having its collector and emitter electrodes serially connected between a power source and the collector and en itter electrodes of the output transistor;

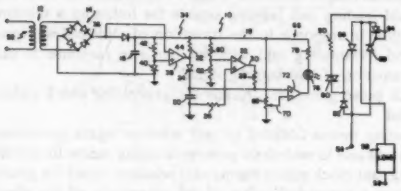
(e) a voltage producing means connected to the base electrode of the second transistor; and

(f) switch means, responsive to the input signal and coupled to the current source, for electrically coupling the current source to the base electrode of the output transistor when the output transistor is driving from the conducting condition to the nonconducting condition and for coupling the current source to the voltage producing means when the output transistor is driven from the nonconducting condition to the conducting condition.

4,506,177
FUNCTION GENERATOR WITH MEANS FOR SELECTIVELY CHANGING THE DISCHARGE TIME CONSTANT

Herman P. Raab, 9140 Sherwood La., Indianapolis, Ind. 46240

Filed Dec. 6, 1982, Ser. No. 447,260
Int. Cl.[3] H03K 5/13, 3/42; G06Q 7/12
U.S. Cl. 307—602 19 Claims

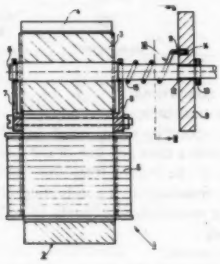


1. A function generator comprising means for providing operating voltage, a capacitor, a first resistor, means for coupling the operating voltage to the first resistor, means for coupling the first resistor to the capacitor for charging the capacitor through the first resistor, a second resistor, means for coupling the capacitor to the second resistor for discharging the capacitor through the second resistor, a third resistor, and means for selectively coupling the third resistor to the capacitor for discharging the capacitor through the third resistor selectively in parallel with the second resistor to alter the discharging time constant of the function generator.

4,506,178
RETURN STOP FOR A SELF-STARTING SYNCHRONOUS MOTOR

Romuald L. Bukoschek, and Peter Steiner, both of Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,765
Claims priority, application Austria, Jan. 27, 1983, 270/83
Int. Cl.[3] H02K 7/10
U.S. Cl. 310—41 1 Claim

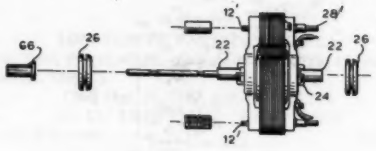


1. A self-starting synchronous motor having return stop means limiting the direction of rotation to only a single predetermined direction, said means consisting of an inert mass which is arranged coaxially with a shaft operatively connected to the motor, is rotatable with respect to the shaft, extends along the shaft in an axial direction and is coupled to the shaft via a helical spring extending coaxially with the shaft, one end of the helical spring being fixedly connected to the inert mass, the helical spring is loosely disposed on the shaft together with the inert mass, the helical spring being connected to the shaft solely by means of friction contact.

4,506,179
UNIVERSALLY MOUNTABLE MOTORS

Edward A. Chernoff, Brookville; Kirby M. Lindtveit, Plainview, and Paul Levy, Lindenhurst, all of N.Y., assignors to Motors & Armatures, Inc., Hauppauge, N.Y.

Filed Apr. 22, 1981, Ser. No. 256,340
Int. Cl.[3] H02K 5/26
U.S. Cl. 310—91 15 Claims

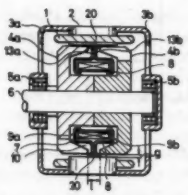


1. A universally mountable motor comprising an armature having first and second opposite faces and defining a cylindrical bore, first and second bearing brackets fitted to the armature at the first and second faces respectively and spanning the bore, bearing means mounted in the first and second bearing brackets and defining a common axis of rotation which is coaxial with the bore, and a rotor fitted in the bore and supported by the bearing means to rotate in the bore, the bearing brackets being secured to the armature by bolts, each of which has a threaded end which projects from one of the brackets and said bracket being formed with wings which extend parallel to one another on opposite sides of said axis and are formed each with at least one undercut slot, and the motor further comprising a screw for fitting in said slot and having a threaded portion which projects from the bracket when the screw is so fitted, and at least one stand-off for fitting to each of said screws, the second bearing bracket being formed with pins which project from the bracket away from the armature and parallel to the axis of rotation of the rotor, said pins being disposed equidistant from the axis of rotation and at opposite sides of the rotor.

4,506,180
FIXED FIELD INDUCTOR-TYPE GENERATOR

Masayuki Shizuka, Katsuta; Nobuhiko Ogasawara, Mito; Hisanobu Kanamaru, and Kazuhiro Tsuruoka, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1983, Ser. No. 464,941
Claims priority, application Japan, Feb. 8, 1982, 57-17530
Int. Cl.[3] H02K 5/00
U.S. Cl. 310—91 13 Claims



1. An inductor-type generator comprising:
an annular stator core on which an armature coil is wound;
a pair of pawl-like magnetic poles opposed to the inner peripheral surface of said stator core with a gap therebetween, the pair of pawl-like magnetic poles being firmly held by a rotary shaft;
a field coil located in a space formed between said pair of pawl-like magnetic poles and secured to the inner peripheral surface of said stator core; and
holding means for holding said field coil therein to position

said field coil within the space formed between said pair of pawl-like magnetic poles and for securing said field coil on the inner peripheral surface of said stator core;

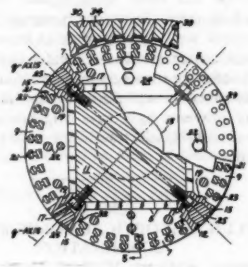
wherein said field coil-holding means includes a holding member with a radially extending collar, said collar having circumferential portions opposed to the inner peripheral surface of said stator core with a uniform space therebetween, said holding member being made of a nonmagnetic metal having a coefficient of linear expansion close to that of said stator core, and a plastically deformable nonmagnetic metallic coupling member disposed in tension of the space between the peripheral surface of said annular stator core and said circumferential portions of said holding member for securing said field coil-holding member to the inner peripheral surface of said stator core.

4,506,181

PERMANENT MAGNET ROTOR WITH COMPLETE AMORTISSEUR

Donald W. Jones, Burnt Hills, and Timothy J. E. Miller, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1984, Ser. No. 585,474
Int. Cl.³ H02K *21/12*
U.S. Cl. 310—156 **4 Claims**



1. A multipole interior permanent magnet rotor, comprising:

a plurality of north and south arcuately shaped pole pieces of flux conducting material;

a shaft of flux conducting material having a central portion with a generally polygonal cross section;

magnet means situated adjacent each fact of sad polygonal central portion, said north pole and south pole pieces situated adjacent said magnet means with said north and south pole pieces alternately distributed circumferentially about said central shaft portion, said magnet means polarized such that the north seeking faces of said magnet means are adjacent said north pole pieces and the south seeking faces of said magnet means are adjacent said south pole pieces;

clamp means of nonmagnetic material situated between adjacent north and south pole pieces so that the axially central portion of said shaft, said magnet means and said clamp means form a cylinder, said clamp means defining axially extending voids and said pole pieces defining axially extending slots circumferentially situated about the periphery of said cylinder;

fastening means extending through said clamp means into holes formed in the corners of said central shaft portion, said clamp pieces having inclined surfaces engaging matching surfaces on said pole pieces to force said pole pieces towards a central portion of said shaft and thereby apply compressive force on said magnets when said fastening means are tightened;

pole piece bars of current conducting material situated in said axially extending slots;

clamp piece bars of current conducting material situated in said axially extending voids; and

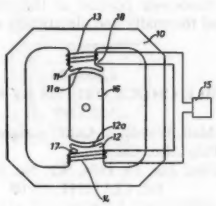
two end rings, one of said end rings electrically joining said pole piece bars and said clamp piece bars at one axial end of said cylinder, the other of said end rings electrically joining said pole piece bars and said clamp piece bars at the other axial end of said cylinder to form a complete amortisseur.

4,506,182

TWO POLE RELUCTANCE MOTOR WITH NON UNIFORM POLE SHAPE FOR BETTER STARTING

Freddie L. Rohdin, Älvsjö, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Sep. 19, 1983, Ser. No. 533,243
Claims priority, application Sweden, Oct. 1, 1982, 8205620
Int. Cl.³ H01J *17/00*
U.S. Cl. 310—193 **5 Claims**



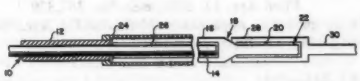
1. In a reluctance motor comprised of a stator having two salient poles, a rotor of a soft magnetic material also having two poles, and a stator winding on each of said stator poles, the improvement wherein at least one of said stator and rotor poles is shaped to constrict flux therein to a portion of the cross section of the flux path, at high flux densities, thereby displacing the magnetic line of symmetry of the respective pole with respect to the physical line of symmetry of the pole, at high flux densities, with respect to the relative positions of the magnetic and physical lines of symmetry when moderate currents are applied to said windings.

4,506,183

HIGH THERMAL POWER DENSITY HEAT TRANSFER APPARATUS PROVIDING ELECTRICAL ISOLATION AT HIGH TEMPERATURE USING HEAT PIPES

James F. Morris, Tempe, Ariz., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 202,228, Nov. 30, 1980, abandoned. This application Jun. 24, 1983, Ser. No. 507,626
Int. Cl.³ H01J *45/00*
U.S. Cl. 310—306 **8 Claims**



1. A high thermal power density heat transfer apparatus for transferring heat from an extremely high temperature source to an electrically isolated lower temperature receiver comprising

a first heat pipe of a tungsten-rhemium alloy containing a lithium working fluid for operation between about 1850° K. and about 1900° K., said first heat pipe comprising

an evaporator portion at one end thereof in thermal communication with said high temperature source, and

a tubular condenser portion at the opposite end thereof for a receiving heat from said evaporator portion, and

a second heat pipe of an alloy of a metal selected from the

group consisting essentially of molybdenum and tungsten containing a lithium working fluid for operation between about 1700° K. and about 1750° K., said second heat pipe being positioned between said first heat pipe and said lower temperature receiver for transferring heat from said first heat pipe to said receiver, said second heat pipe comprising

an annular evaporator portion having an inside diameter greater than the outside diameter of said tubular condenser portion of said first heat pipe, said tubular condenser portion of said first heat pipe extending into said annular evaporator portion of said second heat pipe and being spaced therefrom to form an annular chamber having opposed walls spaced from each other whereby said evaporator portion of said second heat pipe is in thermal communication with and electrically isolated from said condenser portion of said first heat pipe with no solid insulating material in contact with either heat pipe, and

a tubular condenser portion at the opposite end thereof connected thermally and electrically to said receiver.

4,506,184

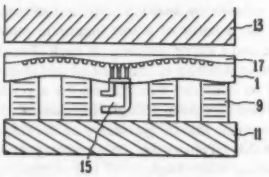
DEFORMABLE CHUCK DRIVEN BY PIEZOELECTRIC MEANS

Graham J. Siddall, Woodside, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 10, 1984, Ser. No. 569,632

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—328 **6 Claims**



1. An apparatus for supporting a workpiece,.comprising:

a deformable chuck having a diameter to thickness ratio greater than or equal to about 40:1.

a rigid plate; and

a plurality of displacement means, mounted on the rigid plate and attached to the deformable chuck, for selectably displacing portions of the deformable chuck.

4,506,185

ELECTRIC REFLECTOR LAMP

Henricus F. J. I. Giller; Antonius J. M. van Hees, and Bauke J. Roelevink, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

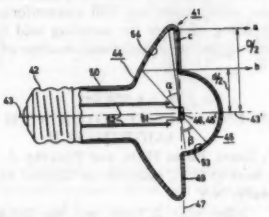
Filed Apr. 12, 1982, Ser. No. 367,320

Claims priority, application Netherlands, Apr. 16, 1981, 8101884; Mar. 11, 1982, 8201010

Int. Cl.³ H01K *1/28, 1/32*

U.S. Cl. 313—113 **8 Claims**

1. An electric reflector lamp comprising a lamp envelope having an interior and an exterior, said lamp envelope having a first, mirror-coated internally concave wall portion having an optical axis and a first focus and opposite thereto a second, mirror-coated substantially spherical wall portion, said second wall portion having an axis and a center of curvature, said axis and said center of curvature of said second wall portion substantially coinciding with said optical axis and said first focus, respectively, of said internally concave wall portion, the largest external dimension of said second wall portion transverse to said axis being smaller than the largest internal dimension transverse to said optical axis of said internally concave wall portion, a third, annular translucent wall portion between said internally concave wall portion and said spherical wall portion and a fourth, tubular wall portion extending from the apex of the internally concave wall portion to said exterior, said wall portions together constituting a single blow moulding, said lamp envelope accommodating a light source which surrounds said first focus and said center of curvature and from which current-supply conductors extend through said wall of said lamp envelope to said exterior, said internally concave wall portion and said substantially spherical wall portion being internally mirror-coated, said internally concave wall portion



being substantially elliptic, a second focus lying outside said lamp envelope and those parts of said mirror-coated wall portions, which throw light rays from said light source onto said translucent wall portion after at most two reflections, surrounds the center of curvature and said first focus through a solid angle of more than 1.5 times 3.1416 steradians, and said substantially spherical wall portion constituting a mask which substantially prevents light rays originating from said light source from reaching said translucent wall portion other than after reflection.

4,506,186

SPARK PLUG AND OPTICAL COMBUSTION SENSOR COMBINATION

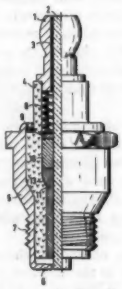
Eckart Damson, Stuttgart; Winfried Moser, Markgröningen; Klaus Müller, Tamm; Franz Rieger, Aalen, and Rainer Schübler, Bietigheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,181

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147290

Int. Cl.³ H01T *13/48*

U.S. Cl. 313—129 **19 Claims**



1. Combined spark plug and optical combustion sensor with a glass rod light guide and means for reducing mechanical stress thereon, having

a metal housing (5) formed with a central opening therein;

an insulator (4) located in the central opening of the housing and formed with a central bore;

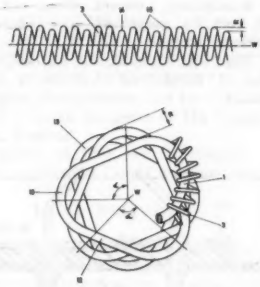
a glass rod (2) centrally located in the bore and serving as a light guide along the length of the combination for light resulting from combustion;
an electrical terminal connector (1) secured to the insulator (4) at a first end portion of the combination and forming a connection end; and
means to conduct electrical energy to the second end portion of the combination,
wherein said means for reducing stress comprises, in accordance with the invention,
a casting compound (3) surrounding the glass rod (2) at least in the region of the terminal connector (1) and providing a pressure-tight seal between the terminal connector (1) and the glass rod (2); and 'two metal elements surrounding the glass rod (2), one (11) of said metal elements forming a metal sleeve of high temperature resistant material and extending over only a limited range of the length of said glass rod at said second end position; and
the other metal element (8,9,10; 12) being in electrical connection with said metal sleeve (11) and transferring electrical energy between said connector and said metal sleeve, while leaving the glass rod unaffected by radial or bending stresses.

4,506,187

LAMP FILAMENT STRUCTURE, AND METHOD OF ITS MANUFACTURE

Dieter Hofmann, Augsburg, and Erolf Weinhardt, Diedorf, both of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,013
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1981, 3123442
Int. Cl.³ H01J *1/02, 9/02*
U.S. Cl. 313—341 **20 Claims**



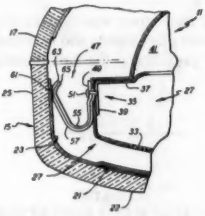
1. Fluorescent lamp filament comprising
a filament wire (1) and a wrapping wire (3) coiled about the filament wire to form a composite filament,
said composite filament being in form of a spiral coil having a plurality of winding loops extending about an axis (W) in which each winding loop of the coil comprises
a plurality of essentially straight portions (5, 8, 12);
a plurality of essentially part-circular portions (6, 9, 10, 13) adjoining the straight portions and connecting adjacent straight portions,
and wherein
the part-circular portion (6, 9, 10, 13) of any one winding loop is angularly offset about said axis (W) with respect to a corresponding part-circular portion of a neighboring winding loop by an angle (α) of between 10° to 110°,
whereby the envelope of the spiral coil will exhibit an undulating outline of depressions (14) and bulges or elevations (15) due to non-congruence of adjacent winding loops;
wherein the envelope of the coil has at least five depressions for each centimeter of coil length along said axis; and
an emitter material applied and retained on said composite filament.

4,506,188

LAMINATED METALLIC MEANS FOR DAMPENING INTERNAL CRT VIBRATIONS

Peter G. Puhak, Seneca Falls, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Nov. 24, 1982, Ser. No. 444,107
Int. Cl.³ H01J *29/07*
U.S. Cl. 313—405 **5 Claims**



1. An improvement in the apertured member-panel assembly of a color cathode ray tube in which the panel has a frontal display area and a surrounding sidewall; and in which the apertured member of said assembly is spatially and moveably supported within said panel by spring means, said apertured member comprising a multi-apertured portion peripherally affixed to a perimetric framing member, the framing member having a side wall portion spatially related to said panel sidewall in a substantially parallel manner, and an integral ledge portion instanding therefrom, said improvement comprising:
at least one resilient vibration dampener formed of resilient laminated bimetallic material and oriented to compressively bridge the spacing between said panel sidewall and the side wall of said apertured member frame, said dampener having a seating portion adapted for affixation to the side wall of said frame and an outwardly extending resilient portion formed to make contact with said panel sidewall, said outwardly extending portion having a terminal end directed away from said display area, said portions being integrated at a concave transition region intermediate therebetween, said dampener material being a laminate of at least two different alpha and beta materials, said alpha material of a softer composition than that of said beta material, the dampener being oriented so that said alpha material makes contact with said panel side wall.

4,506,189

METHODS OF AND APPARATUS FOR COATING THE GLASS ENVELOPE AND PREDETERMINED PORTIONS OF THE END CAPS OF A FLUORESCENT LAMP

James D. Nolan, 623 Little Silver Point Rd., Little Silver, N.J. 07739 and Axel T. Karlsson, 94 Townsend Dr., Middletown, N.J. 07748

Continuation-in-part of Ser. No. 196,077, Oct. 10, 1981, abandoned, which is a continuation of Ser. No. 44,473, Jun. 1, 1979, abandoned, which is a continuation of Ser. No. 940,292, Sep. 7, 1978, abandoned, which is a continuation of Ser. No. 759,823, Jan. 17, 1977, abandoned. This application Aug. 2, 1982, Ser. No. 404,499
Int. Cl.³ H01J *61/35*
U.S. Cl. 313—493 **4 Claims**

1. In a fluorescent lamp including a glass envelope and an end cap at each end of said glass envelope, the improvement comprising:
integrally formed coating means surrounding said glass

envelope and a predetermined portion of each of said end caps; and

said coating means being transparent to light emanating from said fluorescent lamp and upon said glass envelope

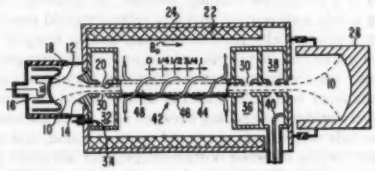
being broken into glass shards said coating means for maintaining said glass shards and said end caps in association thereby preventing the broadcasting of said glass shards.

4,506,190

LINEAR BEAM TUBE WITH REFLECTED ELECTRON TRAP

Robert S. Symons, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 27, 1982, Ser. No. 423,767
Int. Cl.³ H01J *23/08*
U.S. Cl. 315—5.35 **11 Claims**



1. A linear-beam electron tube for generating high-frequency electromagnetic waves comprising:

means for generating a linear-beam of electrons;

circuit means for supporting an electromagnetic wave for linear velocity modulation of said beam to obtain energy exchange between said beam and said wave, said means including an axial passageway for transit of said beam;

means for collecting said beam after transit of said circuit means;

means for extracting electro magnetic energy from said circuit means;

means providing a magnetic field directed along the axis of said passageway for focusing said beam in a uniform cross-section thru said passageway; and

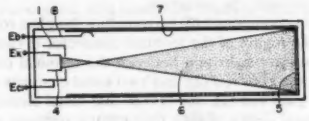
means for generating a periodic magnetic field transverse to said axis along a portion of said beam, said periodic field rotating in orientation with distance along said axis with a pitch approximately equal to the distance traversed by an electron of said beam in one cyclotron period of said electron in said axial magnetic field, said periodic field rotation in a sense opposite to the sense of cyclotron rotation of electron in said axial magnetic field, whereby electrons traveling away from said beam generating means experience in said transverse field a transverse acceleration averaging to zero, and electrons traveling backward toward said beam generating means experience a cumulative transverse acceleration, driving them out of said beam.

4,506,191

LIGHT SOURCE CATHODE RAY TUBE

Shinya Takenobu, Kyoto, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,804
Claims priority, application Japan, Sep. 29, 1980, 55-137359
Int. Cl.³ H01J *29/46, 29/56*
U.S. Cl. 315—14 **13 Claims**



1. A cathode ray tube light source, comprising:

an envelope having a fluorescent material on an interior surface thereof;

a cathode disposed within said envelope;

an anode disposed within said envelope;

only one current control electrode having an aperture therein and disposed between said anode and cathode, said current control electrode being separated from said cathode by a distance l_{GIK} measured in a direction from said cathode to said fluorescent screen and said distance l_{GIK} has a value substantially between 1 mm and 3 mm; and

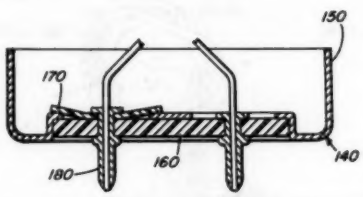
potential source means for applying potentials to said anode, cathode and current control electrode, the potential applied to said anode electrode being higher than the potentials applied to said cathode and current control electrode, whereby a divergent electron beam strikes said fluorescent material to cause light emission.

4,506,192

FLUORESCENT LAMP AND A BASE THEREOF

William D. Koenigsberg, Concord, Mass., and Arthur J. Wageknecht, York, Pa., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 22, 1983, Ser. No. 468,238
Int. Cl.³ H01J *7/44, 17/34, 19/78, 29/96*
U.S. Cl. 315—71 **4 Claims**



1. A fluorescent lamp base comprising

a metal housing;

metal pins for connection to a source of power;

an electrically insulated support member mounted in said metal housing, said electrically insulated support member supporting said metal pins and providing electrical insulation between said metal housing and said metal pins; and

a resistive member for providing a high impedance electrical connection between said metal housing and one of said metal pins, said resistive member being of a material having a volume resistivity from about 10^5 to about 10^8 ohm-cm and a deflection temperature greater than 250° C. at 1,820 kilo dynes/cm^2; said resistive member being a washer shaped resistive member attached to one of said metal pins, said washer shaped resistive member being

electrically connected to the inside surface of said metal housing and to one of said metal pins.

4,506,193

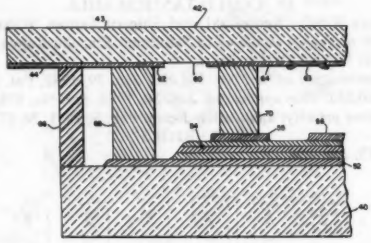
THIN FILM ELECTROLUMINESCENT DISPLAY

Lawrence L. Hope, Stow, and John L. Plumb, Danvers, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 431,976, Sep. 30, 1982, abandoned. This application Oct. 3, 1984, Ser. No. 657,057

Int. Cl.³ H05B *37/00*; **G09F** *9/00*

U.S. Cl. 315—169.3 **17 Claims**



1. In an electroluminescent display device having a substrate. a plurality of layers deposited on said substrate including patterned electrode segments and active layer means, a back glass and conductive means coupled to said patterned electrode segments to enable electrical connection thereto, the improvement comprising thin film resistor means disposed in circuit with said conductive means, said thin film resistor means including at least one thin film resistor associated with each of said electrode segments, said thin film resistor means comprised of a material selected from the group consisting of SiO—Cr, TaN_2, SnO_2, and an alloy of nickel and chromium.

4,506,194

CATHODOLUMINESCENT LIGHT SOURCES AND ELECTRIC LIGHTING ARRANGEMENTS INCLUDING SUCH SOURCES

Sydney A. R. Rigden, Hertfordshire, and Ian J. H. Sweet, Middlesex, both of England, assignors to The General Electric Company p.l.c., England

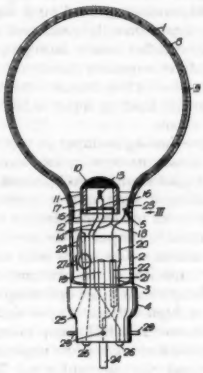
Filed May 16, 1983, Ser. No. 494,905

Claims priority, application United Kingdom, Aug. 19, 1982, 8223872

Int. Cl.³ H01J *63/06*

U.S. Cl. 315—200 R **5 Claims**

1. In a cathodoluminescent lamp including an evacuated bulbous glass envelope with an integral glass neck closed by a pinched glass foot tube incorporating an exhaust tube located around the longitudinal axis of the foot tube, the foot tube terminating in a cap, an anode constituted by an electrically conductive coating on at least part of the interior surface of the bulb wall, such that at least part of the bulb wall is light-transmissive, a layer of phosphor on the whole of the interior of the bulb wall and overlying the said anode coating, which phosphor is excitable to luminescence by electron bombardment, a dome-shaped grid location within the bulb adjacent to the junction between the bulb and neck of the envelope and supported by a hollow metal cylinder disposed coaxially within the neck, an electron emissive cathode mounted within the assembly of the grid and its supporting cylinder, electrically conducting leads, all located wholly within the envelope neck and foot tube, connecting the anode, grid and cathode to respective external contacts carried by the said cap for connection to a circuit arrangement for operation of the lamp from a source of electric current supply, the improvement comprising an additional glass tube provided within the foot tube, extending from the pinch substantially parallel to the exhaust tube and adjacent to the wall of the foot tube, the lead to the anode passing through the said additional tube and being sealed through the pinch, the leads to the cathode and grid passing through the foot tube, and being sealed through the pinch in locations at the side of the exhaust tube remote from the said additional tube and anode lead, and an internal anode contact provided on the interior surface of the envelope neck in the



form of a metal strip, the end portions of which are secured to the glass of the neck and the central portion of which is bent so as to be upstanding from the neck surface, the said anode coating extending from the bulb over the internal neck surface to a level beyond that of the said metal strip, so as to cover the said end portions of the strip, and the inner end of the anode lead being inserted through, and being so shaped that it engages with the said upstanding portion of the metal strip.

4,506,195

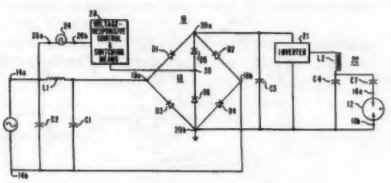
APPARATUS FOR OPERATING HID LAMP AT HIGH FREQUENCY WITH HIGH POWER FACTOR AND FOR PROVIDING STANDBY LIGHTING

Robert T. Elms, Monroeville, Pa., assignor to North American Philips Lighting Corporation, New York, N.Y.

Filed Feb. 4, 1983, Ser. No. 464,435

Int. Cl.³ H05B *37/00*

U.S. Cl. 315—205 **18 Claims**



1. Ballast apparatus for operating HID lamp means at a high frequency and with a high power factor from an AC power source, said ballast apparatus comprising:

apparatus input terminals adapted to be connected across said source of AC power, and apparatus output terminals across which said HID lamp means is adapted to be connected;

series-connected current-limiting input inductor means and input capacitor means connected across said apparatus input terminals, said series-connected input inductor means and input capacitor means having predetermined reactance values at the frequency of the AC power source such that the series combination is tuned off resonance to

pass a predetermined lagging current with the inductive reactance exceeding the capacitive reactance, and additional input capacitor means of predetermined reactance connected across said apparatus input terminals so that the electric energy drawn by said combined series-connected input inductor means and input capacitor means and said additional input capacitor means at least approaches unity power factor;

diode bridge rectifier means having an input connected across said series-connected input capacitor means; filter capacitor means directly connected across the output of said bridge-rectifier means, during operation of said apparatus said filter capacitor means exhibiting thereacross a DC potential which is current-limited by said series-connected current-limiting input inductor means and input capacitor means;

inverter means having an input connected across said filter capacitor means to convert said current-limited DC potential to high-frequency AC potential; and

means including a high-voltage generating and variable impedance series inductor-capacitor resonant circuit connected across the output of the inverter means, a second capacitor connected in series with said output terminals across the capacitor of the resonant circuit so that when said HID lamp means is not operating said resonant circuit impresses a high-voltage across said apparatus output terminals to start said HID lamp means and said resonant circuit exhibits a relatively low impedance which substantially decreases the current-limited DC potential developed across said filter capacitor means, and wherein when said HID lamp means is normally operating there is applied across said apparatus output terminals a predetermined potential to maintain the operation of said HID lamp means and said resonant circuit exhibits a relatively high impedance whereby a substantially increased current-limited DC potential is produced across said filter capacitor means.

4,506,196

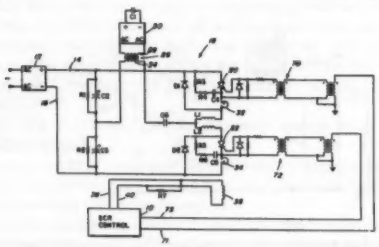
SERIES INVERTER FOR CAPACITOR CHARGING

George L. Bees, Natick, Mass., assignor to Candela Corporation, Natick, Mass.

Continuation of Ser. No. 444,209, Nov. 24, 1982, abandoned, which is a continuation of Ser. No. 206,389, Nov. 13, 1980, Pat. No. 4,366,570. This application Jan. 3, 1984, Ser. No. 567,618

Int. Cl.³ H02M *7/515*

U.S. Cl. 315—241 R **11 Claims**



1. A series inverter load-capacitor charging circuit comprising electronic switches connected in a push pull configuration between opposite junctions of a dc supply and a capacitor charging transformer in a common load circuit, the charging circuit comprising:

means for sensing electric current which passes through the common load circuit;

gate control means responsive to the sensed electric current for directly gating each electronic switch "on" a predetermined time after current flow through the other switch has dropped to zero, that predetermined time being greater than the time required for the other switch to settle to a stable off condition, the gate control means including a control capacitor charging circuit which is inhibited when one of the switches is on and which charges to a level which triggers gating of the other switch after current through the one switch drops to zero, the time constant of the control capacitor charging circuit setting the time between turn off and turn on of respective switches.

4,506,197

METHOD OF CONTROLLING MILL MOTORS SPEEDS IN A COLD TANDEM MILL

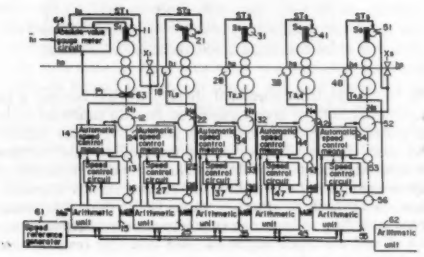
Katsuya Kondo, Amagasaki, and Shigeru Tajima, Wakayama, both of Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 344,058, Jan. 29, 1982, Pat. No. 4,460,852. This application Jan. 30, 1984, Ser. No. 575,399

Claims priority, application Japan, Feb. 6, 1981, 56-17288

Int. Cl.³ B21B *37/00*

U.S. Cl. 318—34 **1 Claim**



1. A method for controlling the revolving speeds of plural mill motors which drive respective stands of rollers in a cold tandem mill, comprising the steps of:

producing speed control signals for respectively driving said motors at associated reference speeds;

for each motor, generating a drooping characteristic control signal which modifies the speed control signal for that motor to produce a decrease in motor speed in response to an increase in motor current;

comparing the decrease in motor speed to one of said reference speed and the actual motor speed, to thereby obtain a speed drop ratio for each motor; and

generating a signal to correct said drooping characteristic control signal after the material being rolled has been threaded through the stand of rollers so that said speed drop ratio is substantially the same for all of said motors.

4,506,198

TRIGGER SPEED CONTROL SWITCH

Charles R. Savas, Huntsville, Ala., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 31, 1982, Ser. No. 413,598

Int. Cl.³ H02K *27/20*

U.S. Cl. 318—301 **11 Claims**

1. A speed control switch comprising, in combination:

an insulating housing having switch contacts mounted therein;

an operator mounted for reciprocal movement in said housing and movable to operate said switch contacts;

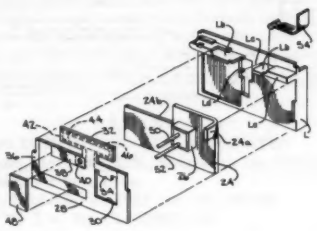
a wiping contactor carried by said operator; and

speed control circuit means for providing a variable output signal responsive to operator position comprising:

a substantially flat heat sink mounted in said housing in edgewise relation to said wiping contactor;

a thyristor having its anode affixed to said heat sink;

an insulating sheet comprising a main body and a flexible flap extending therefrom, said insulating sheet having a printed circuit formed thereon comprising conductive segments extending from said main body along said flexible flap and defining coextensive spaced resistor and collector segments on said flap, said insulating sheet positioned in a face-to-face engagement with a flat surface of said heat sink and said flap being folded over in said housing to a position in flatwise relation to said wiping contactor wherein said wiping contactor bridges said resistor



and collector segments for varying the amount of resistance in said speed control circuit in response to operator movement, and a flexible tab formed on said insulating sheet having a conductive extension of said collector segment formed thereon, said tab being deflected against the anode of said thyristor in electrically conductive engagement upon positioning said insulating sheet against said heat sink for electrically connecting said collector segment to said heat sink; and

means electrically connecting said printed circuit and said heat sink to said switch contacts.

4,506,199

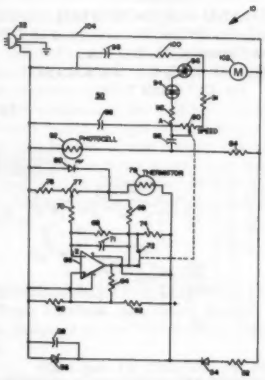
AGRICULTURAL FAN CONTROL SYSTEM

Bernard J. Asche, Rte. 4, Willmar, Minn. 56201

Filed Dec. 28, 1982, Ser. No. 454,037

Int. Cl.³ G05B 5/00

U.S. Cl. 318—313 **3 Claims**



1. Agricultural fan motor control system comprising:

a. low-voltage control circuit means including temperature setting variable resistor, temperature sensing means in a top leg of a Wheatstone bridge, the leg also including said temperature setting variable resistor for setting desired level of temperature, and an operational amplifier connected between one bottom leg of said bridge and a wiper arm of said temperature setting variable resistor and output of an operational amplifier connected to a LED means transmitting an output signal proportionally inverted resistance of said temperature sensing means, and a resistor connected between an output of said operational amplifier and a junction of bottom legs of said Wheatstone bridge;

b. high-voltage phase controlled power circuit means including a photocell for receiving said output signal from said LED means and means for providing a speed control signal, said photocell and a phase control resistor connected in series between an AC power source means, a junction of said photocell and said phase control resistor connected to a wiper arm and one side of a speed variable control resistor through a capacitor;

c. triac switching means connected between said AC power source means and a fan motor means, and a gate of said triac switching means connected to said speed control signal through said speed variable control resistor for controlling speed of said fan motor means through said triac switching means, said fan motor means connected between said triac switching means and one side of said power source means; and,

d. modulating means including said operational amplifier and one side of said temperature sensing means connected thereto, and a switch connecting between an output of said operational amplifier and a feedback resistor connected across said operational amplifier for switching said modulating means in and out of said low-voltage control circuit means for modulating said speed control signal with respect to an inverted voltage curve for a slower fan motor means speed control signal for a first five degrees Fahrenheit of temperature rise and a faster fan motor means speed control signal for a second two degrees temperature rise of seven degrees of temperature rise, said speed variable resistor connected to said triac switching means providing a minimum fan motor means speed control signal and said speed variable resistor including a connected switch for turning off said modulating means providing for a fan motor means speed signal at a predetermined air movement when a predetermined temperature is exceeded thereby maintaining a predetermined temperature and predetermined air movement.

4,506,200

METHOD AND APPARATUS FOR OPERATING A D.C. MOTOR

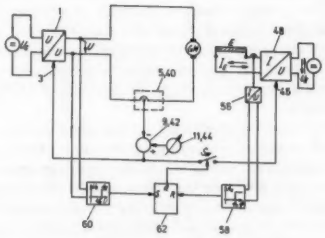
Walter Dätwyler, Zurich, and Leo Meister, Merishausen, both of Switzerland, assignors to SIG Swiss Industrial Company, Rhine Falls, Switzerland

Continuation of Ser. No. 178,611, Aug. 15, 1980, abandoned. This application Dec. 30, 1983, Ser. No. 567,253

Claims priority, application Switzerland, Aug. 17, 1979, 7540/79

Int. Cl.³ H02P 1/00

U.S. Cl. 318—493 **19 Claims**



1. A control system for operating a shunt wound DC motor having armature and excitation circuits comprising:

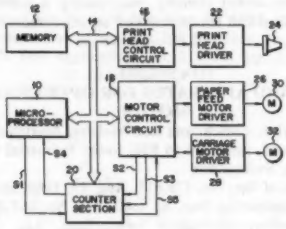
supply means;
presetting means for selecting a desired armature current reference value signal;
armature current measuring means coupled to said armature circuit for measuring the current in the armature circuit of said motor;
semi-conductor armature voltage actuating means for selectively coupling said supply means to said armature circuit;
excitation current generating means having a control input for adjustably supplying current to said excitation circuit;
combining means for combining the output signal of said armature current measuring means with said armature current reference value signal of said presetting means for controlling at least one of the armature voltage actuating means and the excitation current actuating means;
a first threshold level circuit for sensing the armature voltage of said armature circuit;
a second threshold level circuit for sensing the excitation current of said excitation circuit; and
switching means coupled to and controlled by said first and second threshold level circuits for coupling the output of said combining means to the control input of said current generating means and said armature voltage actuating means, whenever the threshold level of said first threshold sensitive means for said armature voltage is reached and for decoupling the output of said combining means only from said current generating means whenever the threshold level of said first threshold sensitive means for said excitation current is reached.

4,506,201

MICROPROCESSOR CONTROLLED PULSE MOTOR

Yukio Tsuneki, Hanno, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 9, 1983, Ser. No. 492,829
Claims priority, application Japan, May 13, 1982, 57-80516
Int. Cl.³ G05B *19/407*
U.S. Cl. 318—603 **6 Claims**



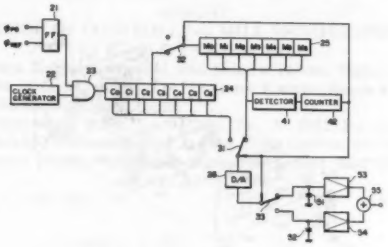
1. A microprocessor controlled pulse motor comprising:
a microprocessor having first and second operation modes, the first operation mode executing a program according to an applied interrupt signal and for producing time data according to the program executed, and the second operation mode producing no output, the periods of the first and second operation modes being determined by the microprocessor;
counter means for producing a pulse signal having a period which is varied according to the time data in the first operation mode and which is constant in the second operation mode which in the first operation mode supplies an interrupt signal to said microprocessor in synchronism with production of said pulse signal, and which in the second operation mode inhibits said interrupt signal from being supplied to said microprocessor; and
motor control means for controlling the rotation of the pulse motor according to said pulse signal.

4,506,202

DIGITAL SERVO CIRCUIT

Shigeru Tajima, Atsugi; Hiroshi Okada, Sagamihara, and Kenji Nakano, Ebina, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,191
Claims priority, application Japan, Jun. 30, 1982, 57-111568; Jul. 2, 1982, 57-115227
Int. Cl.³ G05B *19/08*
U.S. Cl. 318—603 **8 Claims**



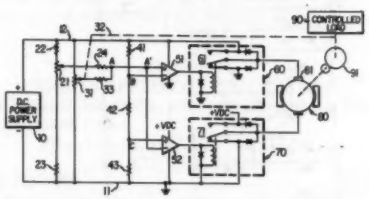
1. A servo circuit for producing a servo control signal for controlling the rotation of a motor comprising:
clock means for generating clock pulses;
a source of reference pulses;
a source of pulses corresponding to said rotation of said motor;
means for generating window pulses in response to the phase difference between said reference pulses and said pulses corresponding to said rotation of said motor;
gate means for gating said clock pulses in response to said window pulses to produce gated pulses;
first counter means for counting said gated pulses to produce a first counter signal and generating divided gated pulses;
second counter means for counting said divided gated pulses to produce a second counter signal; and
mixing means for producing a mixed signal from said first and second counter signals as said servo control signal.

4,506,203

SMALL DEADBAND SERVOCONTROL SYSTEM

William G. Redmond, Jr., Dallas, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Oct. 13, 1982, Ser. No. 434,154
Int. Cl.³ G05B *5/01*
U.S. Cl. 318—624 **18 Claims**



1. A circuit for controlling the position of a reversible motor having a driven member, which comprises:
(a) control means for selectively controlling the application and polarity of electrical power to said motor to cause movement of said driven member in either direction;
(b) means responsive to the position of said driven member for generating a position feedback signal indicative of the actual position of said driven member;

(c) means for generating a command position signal indicative of a desired position of said driven member;

(d) means responsive to said command position signal and to said position feedback signal for generating a position error signal indicative of the relative difference between the actual position and the desired position of said driven member;

(e) means for generating a plurality of reference voltages; and

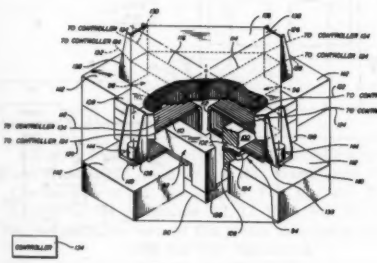
(f) a pair of comparator means coupled to said control means, each of said comparator means for comparing the voltage magnitude of said position error signal to a respective voltage magnitude of said reference signal and applying a control signal to said control means until the difference between the magnitude of the respective reference voltage and the error signal falls within a predetermined dead-band voltage limit.

4,506,204

ELECTRO-MAGNETIC APPARATUS

Daniel Galburt, Norwalk, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 10, 1983, Ser. No. 502,993
Int. Cl.³ G05B *1/06*
U.S. Cl. 318—653 **7 Claims**



1. A commutatorless electro-magnetic alignment apparatus comprising, in combination:

at least three magnet assemblies, means for mounting said magnet assemblies in spaced relationship one with respect to the others;

at least three coil assemblies mounted to pass through the high flux region of the magnet assemblies respectively, the width of said coil assemblies being substantially less than the width of said high flux regions respectively, means for controlling the flow of current through said coil assemblies respectively;

means for connecting the coil assemblies to form a single structure which is rigid in the plane of motion and movable with respect to said magnet assemblies;

said coil assemblies being wound with respect to each other so that by controlling the supply of current to said coils said structure can be moved selectively in three degrees of freedom.

4,506,205

ELECTRO-MAGNETIC ALIGNMENT APPARATUS

David Trost, Fairfield, and Daniel Galburt, Norwalk, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

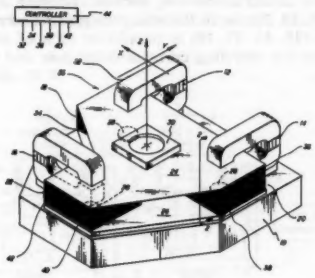
Filed Jun. 10, 1983, Ser. No. 502,998
Int. Cl.³ G05B *1/06*
U.S. Cl. 318—653 **10 Claims**

1. A commutatorless electro-magnetic alignment apparatus comprising, in combination:

three magnets, means for mounting said magnets in spaced relationship one with respect to the others;

three coil assemblies mounted to pass through the magnetic fields of said magnets respectively, means for controlling the flow of current through said coil assemblies respectively;

means for connecting the coil assemblies to form a single structure which is rigid in the plane of motion and movable with respect to said magnets, means for mounting an object on said structure; and



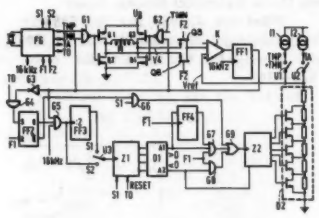
said coil assemblies being wound with respect to each other so that by controlling the supply of current to said coils and structure can be moved selectively in three degrees of freedom.

4,506,206

METHOD OF AND CIRCUIT ARRANGEMENT FOR CONTROLLING THE TORQUE OF A STEPPING MOTOR

Werner F. Thommen, Staefa, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1983, Ser. No. 456,680
Claims priority, application Switzerland, Jan. 21, 1982, 383/82
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **14 Claims**



1. A method of controlling the torque of a stepping motor which comprises: energizing the motor with electric pulses of variable duration, controlling the duration of the energizing pulses so that the motor current is measured and maintained approximately constant at a predetermined current level, and deriving information about the actual value of the motor current by determining the induced voltage during a plurality of measuring intervals, from which information a reference value is derived for controlling the motor current.

4,506,207

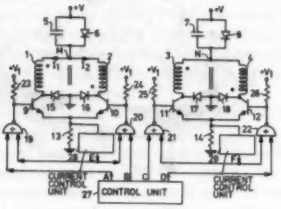
STEP MOTOR DRIVING CIRCUIT

Gianpietro Ferrari, Milan, Italy, assignor to Honeywell Information Systems Italia, Milan, Italy

Filed Sep. 30, 1983, Ser. No. 537,917
Claims priority, application Italy, Oct. 6, 1982, 23622 A/82
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **2 Claims**

1. A step motor driving circuit for a motor having at least

two pairs of magnetically coupled phase windings (1, 2) (3, 4) comprising control means (27) delivering switching commands to switching devices (9, 10, 11, 12), one switching device being associated to each winding, an energization current flowing in selected said windings from a voltage source when the related switching devices are switched on, said magnetically coupled windings being energized in a mutually exclusive way, said driving circuit comprising current chopping control means (13, 28, 19, 20) and further comprising a first current recycling diode (15, 16, 17, 18) in parallel to each of said switching devices for recycling currents induced in said magnetically



coupled windings when switching off said devices characterized in that it comprises further:

a second diode (6) and a capacitor (5), in parallel with each other and series connected between said voltage source and one of said pairs of magnetically coupled windings,

said second diode enabling current flowing from said voltage source to either one or the other of said winding, said capacitor being charged by recycling current induced in any one of said windings and discharging on any one of said windings when the related switching device is switched on.

4,506,208

REFERENCE VOLTAGE PRODUCING CIRCUIT

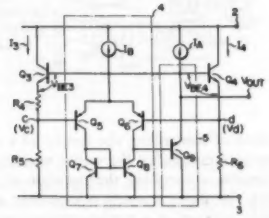
Katsumi Nagano, Shimonoseki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 4, 1983, Ser. No. 538,891

Claims priority, application Japan, Nov. 22, 1982, 57-205060

Int. Cl.³ G05F *3/20*

U.S. Cl. 323—314 **6 Claims**



1. A reference voltage producing circuit comprising:

a voltage signal producing circuit having a first series circuit which includes a first transistor, a first resistor and a second resistor connected in series between the first and second terminals of a power supply source with one end of the collector-emitter path of said first transistor connected to said first terminal, a second series circuit which includes a second transistor and a third resistor connected in series between said first and second terminals with one end of the collector-emitter path of said second transistor connected to said first terminal, with the base electrode thereof connected to the base electrode of said first transistor, and a first constant current source connected between said first terminal and the base electrode of said second transistor for supplying a constant current to the base electrodes of said first and second transistors, a first voltage signal being produced on a node between said first and second resistors and a second voltage signal being produced on a node between said second transistor and said third resistor;

an differential amplifier which is supplied with said first and second voltage signals; and

an emitter follower circuit which is connected between said base electrode of said second transistor and said second terminal, and is controlled by the output signal of said differential amplifier to produce said reference voltage at a constant level.

4,506,209

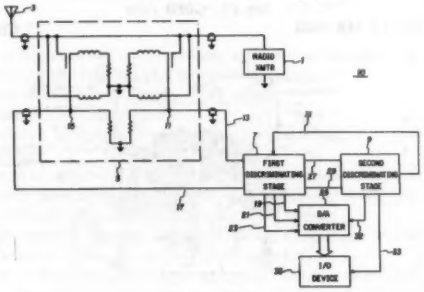
TRACKING IMPEDANCE MEASURING SYSTEM

Harvey L. Landt, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1982, Ser. No. 453,686

Int. Cl.³ G01R *29/22*

U.S. Cl. 324—57 R **8 Claims**



1. A tracking impedance measuring system comprising:

directional coupler means for obtaining forward signal sample representative of the forward power applied from a signal source to a load and a reflected signal sample representative of the reflected power between the load and the signal source;

first discriminator means for mixing the forward signal sample and the reflected signal sample with an injection signal to obtain a forward signal analog, and a reflected signal analog and an RF signal sample; and

second discriminator means for generating the injection signal from the RF signal sample.

4,506,210

METHOD FOR IDENTIFYING CABLE CONDUCTORS USING TWO SIGNALS AT DIFFERENT FREQUENCIES

Roger P. Chase, Wheaton, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 18, 1982, Ser. No. 349,737

Int. Cl.³ G01R *19/00*

U.S. Cl. 324—66 **1 Claim**

1. A method for testing a cable comprising a plurality of conductors to identify which conductor at a second end of the cable is continuous with a selected conductor at a first end of the cable, the method comprising the steps of:

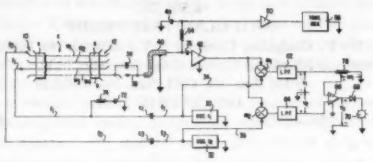
applying an alternating current signal to the selected conductor at the first cable end;

applying a second alternating current signal of a frequency different from that of the first recited alternating current signal to a second conductor at the first end of the cable;

capacitively coupling a high gain, high input impedance

amplifier at the second end of the cable to a chosen conductor;

amplifying and filtering the coupling signal in two parallel frequency selective filters tuned to the frequencies of said



first and second recited alternating current signals, respectively; and

comparing the amplitudes of said filtered signals to determine if said chosen conductor is said selected conductor.

4,506,211

STORM WARNING METHOD AND APPARATUS

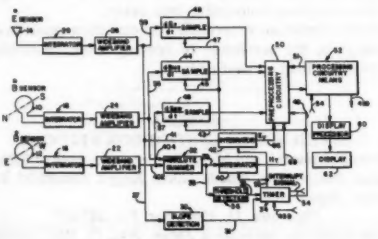
Ernest W. Coleman, 1465 Sinkler Rd., Warminster, Pa. 18974

Continuation of Ser. No. 235,168, Feb. 17, 1981, Pat. No. 4,422,037. This application Jul. 22, 1983, Ser. No. 516,288

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.³ G01W *31/02*

U.S. Cl. 324—72 **11 Claims**



1. An apparatus for determining the location of lightning strokes, each lightning stroke generating electric (E) and magnetic (H) field components, said apparatus comprising:

receiving means for receiving separately the electric (E) and magnetic (H) field components of a lightning stroke and for generating electrical signals associated with said E and H field components, said electrical signals being characterized by an initial rise time and a plurality of subsequent sub pulse risetimes; and

means coupled to said receiving means for determining the distance to said lightning stroke from said apparatus by operating upon said electrical signals associated with both said E and H field components, and for determining the direction to said lightning stroke relative to said apparatus by operating upon said electrical signals associated with both said E and H field components.

4,506,212

METHOD AND APPARATUS FOR TESTING INTEGRATED CIRCUITS USING AC TEST INPUT AND COMPARISON OF RESULTING FREQUENCY SPECTRUM OUTPUTS

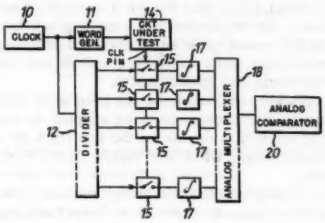
Alan J. Melia, Ipswich, England, assignor to The Post Office, London, England

Filed Jul. 30, 1980, Ser. No. 173,743

Claims priority, application United Kingdom, Aug. 2, 1979, 7927009

Int. Cl.³ G01R *15/12, 27/00*

U.S. Cl. 324—73 R **4 Claims**



1. A method of testing integrated circuits having data input and data output pins and also having other electrical connection pins, said method comprising the steps of:

applying an alternating logic signal and operating electrical power to an integrated circuit;

measuring the frequency spectrum of the resulting waveform at an externally accessible electrical connector pin which is not the intended data output pin of the circuit but which is connected internally to substantially all the logic gates within the integrated circuit under test, and

comparing that frequency spectrum with the corresponding expected frequency spectrum.

4,506,213

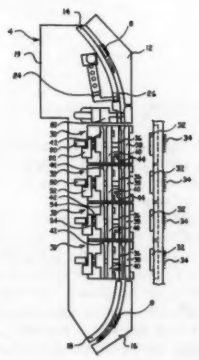
ELECTRONIC DEVICE HANDLER

Bruce O'Connor, San Diego, Calif., assignor to Sym-Tek Systems, Inc., San Diego, Calif.

Filed Jul. 18, 1983, Ser. No. 514,489

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—73 AT **12 Claims**



1. In a handler a mechanism for presenting in parallel a plurality of devices for testing comprising:

(a) a feeding means adapted to provide a plurality of devices, one at a time,

(b) an exit means for receiving each device after it has been tested,

(c) a plurality of shuttle means interposed between the feed means and the exit means, each shuttle means being adapted to individual reciprocal movement between at least a test position and a load position,

(d) a test track affixed to each shuttle means and disposed thereon such that, when each shuttle means is in its load position, its test track is a segment of a continuous track between and in communication with the feed means and the exit means,

(e) a by-pass track affixed to each shuttle means and disposed thereon such that, when each shuttle means is in its test position, its by-pass track is a segment of said continuous track, the continuous track existing whenever all of the shuttle means are in either their test or load positions, the continuous track comprising at least any combination of test tracks and by-pass tracks,

(f) a plurality of contactors, one associated with each shuttle means, each contactor being adapted to make electrical contact with a device on the test track of an associated shuttle means when said shuttle means is in its test position,

(g) a plurality of individually actuated, releasable stop means, one associated with each test track, and each operable to stop movement of a device at a suitable position along an associated test track, and

(h) a means of urging the devices from the feed means and along the continuous track in the direction of the exit means.

4,506,214

MEASURING TRANSFORMER

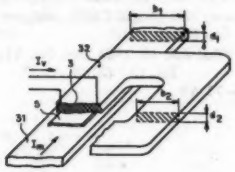
Heinz Lienhard, Zug, and Gernot Schneider, Baar, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Division of Ser. No. 918,446, Jun. 23, 1978,. This application Sep. 17, 1981, Ser. No. 303,076

Claims priority, application Switzerland, Jul. 8, 1977, 8455/77; May 24, 1978, 5644/78

Int. Cl.³ G01R *1/20, 33/00*

U.S. Cl. 324—117 R **7 Claims**



1. A measuring transducer for the measurement of current comprising:

a measuring conductor for carrying the current to be measured, said conductor having a cross section wherein the thickness of said conductor is small in comparison to the width of said conductor;

a pre-magnetizing winding for carrying an alternating pre-magnetizing current, said winding being a coil of a cross section wherein the thickness of said coil is small in comparison to the width of said coil, said coil being positioned relative to said conductor so that at least a part of said coil is closely adjacent to said conductor; and

an anisotropic magnetic thin film positioned relative to said conductor and said winding in a region wherein both said current to be measured and said pre-magnetizing current produce a uniform magnetic field, said film being responsive to a magnetic flux of said current to be measured and responsive to a magnetic flux of said pre-magnetizing current to become saturated in alternate directions of magnetization corresponding to alternating direction of said pre-magnetizing current whereby the point of time of the saturation of said film is dependent on the strength of the current to be measured.

4,506,215

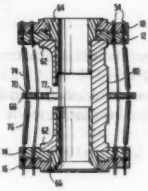
MODULAR TEST PROBE

Charles P. Coughlin, Chelsea, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 279,128

Int. Cl.³ G01R *1/06*

U.S. Cl. 324—158 P **9 Claims**



1. A probe assembly for arraying clustered buckling beam elements for electrically testing an integrated circuit to provide continuity between circuit terminal pads and a test device comprising:

a centerpost;

buckling beam guide elements positioned at ends of said centerpost, said buckling beam guide elements spaced apart by a predetermined distance, said guide elements having a number of throughholes to receive buckling beam elements;

an array of buckling beam elements positioned by said guide elements around said centerpost; and

means on said buckling beam array and biased by the buckling beam array into contact with said centerpost to prebow said array of buckling beam elements in one direction, and said array of buckling beam elements passing through said means biased by said buckling beam array, said centerpost limiting movement of said means biased by said array of buckling beams to isolate the buckling beam elements from contacting each other;

wherein variations in terminal pad elevation result in differences in the amplitude of bowing while maintaining a constant load on said pads.

4,506,216

SPEED METER SYSTEM FOR VEHICLE

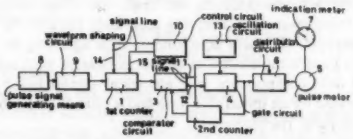
Masaaki Fukamachi, and Masahiko Sueyoshi, both of Miyazaki, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1982, Ser. No. 387,557

Claims priority, application Japan, Jun. 16, 1981, 56-91577

Int. Cl.³ G01P *3/489*

U.S. Cl. 324—166 **4 Claims**



1. A speed meter system for a vehicle comprising:

(a) first pulse generating means for providing pulses in accordance with the speed or engine speed of a vehicle;

(b) first counter means, coupled to said first pulse generating means, for counting the number of pulses generated by said pulse generating means;

(c) second counter means;

(d) comparator means, coupled to said first and second counter means, for comparing the counts therein, said comparator means producing a first judgement signal indicative of whether the count of the first counter means is larger than or smaller than the count of the second counter means and a second judgement signal indicative of the equality or inequality of the counts in said first and second counters;

(e) gate circuit means coupled to said comparator means for receiving said second judgement signal therefrom, said gate means being opened when said second judgement signal indicates an inequality and closed when said second judgement signal indicates equality;

(f) second pulse generator means coupled to said second counter means through said gate circuit means for applying pulses to said second counter means when said gate circuit means is open, thereby changing the count in said second counter means; and

(g) output means coupled to said second pulse generator means through said gate circuit means for providing an output indicative of the speed of the vehicle or engine thereof in accordance with the output of said second pulse generator means.

4,506,217

GEAR TOOTH POSITION AND SPEED SENSOR WITH FOUR, BRIDGE CIRCUIT CONNECTED, MAGNETIC RESISTANCE TRACKS

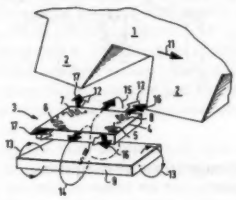
Manfred Rothley, Kraichtal; Erich Zabler, Stutensee; Kurt Neuffer, and Karl-Franz Reinhart, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,650

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1981, 3132549

Int. Cl.³ G01R *33/06;* G01B *7/30;* G01P *3/44*

U.S. Cl. 324—208 **13 Claims**



1. Magnetic field effect position sensor, to sense the position of a rotating body (1), having magnetically permeable projecting teeth (2,10) of ferro-magnetic material and a reference position means (10), with respect to the sensor (3), comprising

a stationary permanent magnet (9) providing a bias field;

a substantially non-conductive substrate (4) in the form of a rectangle and mounted within said bias field in fixed relation to said magnet;

four ferro-magnetic resistance tracks (5–8) located on the substrate, each positioned, at a different corner of the rectangle at an angle of approximately 45° to the direction of rotation of said body and facing the projecting teeth, with two tracks (5,6; 7,8) each being located adjacent respective axial ends of the teeth, and the spacing of the tracks, in the direction of rotation of said body, being matched to the pitch of the teeth,

said tracks being connected together so as to produce a rotary speed signal and a signal representative of passage of said reference means (10) past said substrate.

4,506,218

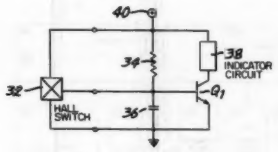
CONDITION SENSING ARRANGEMENT FOR AC MACHINES

Fred A. Brown, and Alan F. Grouse, both of Woodstock, N.Y., assignors to Rotron Incorporated, Woodstock, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,126

Int. Cl.³ G01R *31/02;* G08B *21/00*

U.S. Cl. 324—158 MG **12 Claims**



1. The combination of an alternating current dynamoelectric machine and operation monitoring circuit,

the dynamoelectric machine including a stator with at least one winding adapted to conduct alternating current, a rotor, opposed generally cylindrical surfaces on the stator and the rotor separated by an air gap, and the air gap bridged by an alternating magnetic field established when the stator winding is conducting, the alternating magnetic field in the air gap having an amplitude that decreases by reason of any one of several flux reducing faulty conditions;

the operation monitoring circuit including air gap magnetic flux level sensing means and means connected thereto for producing an alarm output;

said flux level sensing means and said means for producing an alarm output being connected in cooperative relationship to define a predetermined flux alarm level, said means for producing an output comprising means for causing a change in an output condition of the operation monitoring circuit when air gap flux detected by the sensing means falls below said flux alarm level and independent of comparison with any further air gap flux indication.

4,506,219

BOREHOLE TOOL OUTRIGGER ARM DISPLACEMENT CONTROL MECHANISM

Arley G. Lee, Pasadena, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 30, 1982, Ser. No. 403,608

Int. Cl.³ G01N *27/72;* E21B *17/10;* G01R *33/00*

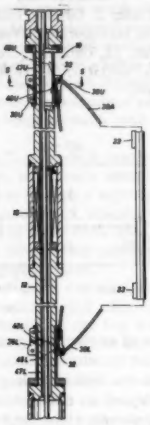
U.S. Cl. 324—221 **21 Claims**

1. For use in a borehole tool having at least one radially extendable and retractable outrigger arm, a displacement control mechanism for regulating and controlling the axial displacement of the outrigger arm relative to the tool as the arm's effective extension from the tool changes, comprising:

(a) first and second securing means for securing the respective ends of the arm to the tool at axially displaced locations, said first and second securing means each including means providing for relative axial movement of its respective end of the arm in response to increases and decreases in the radial extension thereof,

(b) said first and second securing means each including guide means for guiding said respective arm end axial movement and causing corresponding predetermined rotation

thereof about the exterior of the tool according and in response to said axial movement, and



(c) said arm being sufficiently transversely stiff to resist twisting spirally about the tool and to remain axially extended and aligned.

4,506,220

TEMPERATURE COMPENSATED MAGNETORESISTIVE EFFECT THIN FILM MAGNETIC SENSOR

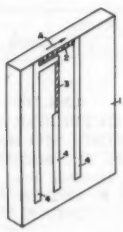
Takeshi Sawada, Yokohama; Kou Yoneda, Kawasaki; Akira Shinmi, Kawasaki; Hiroshi Takagi, Kawasaki; Shuzo Abiko, Chichibu, and Hirokazu Goto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Nov. 2, 1981, Ser. No. 317,386

Claims priority, application Japan, Nov. 10, 1980, 55-157066; Nov. 10, 1980, 55-157067; Nov. 13, 1980, 55-158823

Int. Cl.³ G01R *33/06*; H01L *43/08*

U.S. Cl. 324—252 **8 Claims**



1. A temperature compensated magnetoresistive effect thin film magnetic sensor, comprising:

a base having a surface on which may be formed elements defining a thin film magnetic sensor;

a first magnetoresistive effect element formed on said base, having opposing ends and a predetermined length in the direction of an anisotropic magnetic field for detecting a magnetic signal;

an L-shaped second magnetoresistive effect element formed on said base, having opposing ends, a first section substantially parallel to said first magnetoresistive effect element, and a second section substantially orthogonal to said first magnetoresistive effect element, the resistance of said second magnetoresistive effect element varying in response to changes in temperature;

a first electrode connecting one end of said first magnetoresistive effect element to one end of said second magnetoresistive effect element;

a second electrode connected to the other end of said first magnetoresistive effect element; and

a third electrode connected to the other end of the said second magnetoresistive effect element, said first, second, and third electrodes being for applying a voltage to said first and said second magnetoresistive effect elements, respectively.

4,506,221

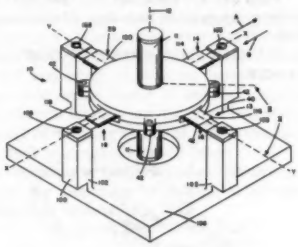
MAGNETIC HEADING TRANSDUCER HAVING DUAL-AXIS MAGNETOMETER WITH ELECTROMAGNET MOUNTED TO PERMIT PIVOTAL VIBRATION THEREOF

Paul F. Hayner, Swampscott, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jun. 28, 1982, Ser. No. 392,858

Int. Cl.³ G01R *33/02*

U.S. Cl. 324—256 **7 Claims**



1. A dual-axis magnetometer comprising:

(a) a base plate;

(b) two pairs of opposed support posts disposed normal to the surface of said base plate and aligned along orthogonal X,Y axes, said posts being attached to said base plate by means for allowing resilient flexure along the one of said axes upon which each of said posts is disposed;

(c) a cruciform transducer assembly having a central hub and two pairs of orthogonal arms attached at their outward ends to the tops of respective ones of said posts and adapted for flexural movement, said arms each being a bimorph generating an electrical signal when flexed and including electrode means for outputting said signal;

(d) an electromagnetic coil carried by said transducer assembly disposed normal to said transducer assembly concentric with said hub and having equal portions above and below said hub; and,

(e) excitation means connected to said coil for exciting said coil with an ac electrical signal whereby said coil is caused to vibrate and said arms are made to flex and create output signals at said electrode means as a result of the combined magnetic fields of said coil and the earth at the location of the magnetometer.

4,506,222
METHODS OF PRODUCING IMAGE INFORMATION FROM OBJECTS

William A. Edelstein, Schenectady, N.Y.; James M. S. Hutchison; Glyn Johnson, both of Aberdeen, Scotland; Thomas W. T. Redpath, Stonehaven, Scotland, and John R. Mallard, Aberdeen, Scotland, assignors to National Research Development Corporation, London, England

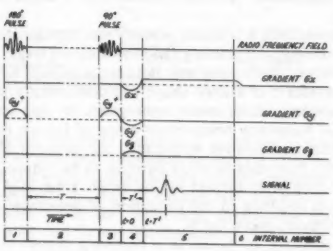
PCT No. PCT/GB81/00044, § 371 Date Nov. 9, 1981, § 102(e) Date Nov. 9, 1981, PCT Pub. No. WO81/02788, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 13, 1981, Ser. No. 320,953

Claims priority, application United Kingdom, Mar. 14, 1980, 8008773

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 9 Claims



1. A method of deriving image information from an object using nuclear magnetic resonance signals comprising:

subjecting an object to a continuous static magnetic field along an axis and carrying out a set of sequential steps which comprise:

(1) selectively exciting nuclear spins in a selected plane in the presence of a first gradient of the static magnetic field, the direction of said first gradient being perpendicular to said plane;

(2) reversing the direction of the said first gradient and applying a second gradient and a third gradient of the magnetic field, the direction of the second gradient being orthogonal to the direction of the first gradient, and the third gradient having a direction orthogonal to the directions of both the first and second gradients for phase encoding the selected nuclear spins in the direction of the third gradient;

(3) removing the third gradient and reversing the direction of the second gradient of the magnetic field and holding the said reversed second gradient for reading out the resultant free induction signal from the said object;

and then successively repeating the above set of sequential steps with different values of time integral of the third gradient, there being a recovery interval between the repetition of successive sets of steps.

4,506,223
METHOD FOR PERFORMING TWO-DIMENSIONAL AND THREE-DIMENSIONAL CHEMICAL SHIFT IMAGING

Paul A. Bottomley, Clifton Park, and William A. Edelstein, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,797

Int. Cl.³ G01R *33/08*

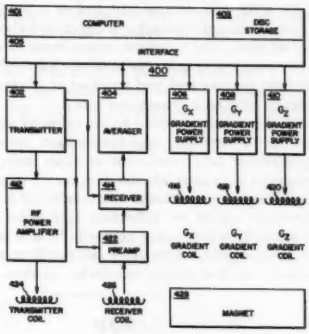
U.S. Cl. 324—309 36 Claims

1. A method of performing NMR chemical shift imaging in which the imaging information is gathered simultaneously from a predetermined region of an NMR sample, said method comprising the steps of:

(a) applying a static magnetic field along an axis of said NMR sample;

(b) exciting to resonance a plurality of nuclear spins situated in said predetermined region such that said excited nuclear spins produce an NMR signal;

(c) applying simultaneously, for a time shorter than the duration of said NMR signal, first and second mutually orthogonal magnetic field gradients each having one of a predetermined number of selectable magnitudes to phase encode into said NMR signal information of the spatial



distribution of said excited nuclear spins within said predetermined region:

(d) irradiating said NMR sample with a 180° RF pulse so as to invert said excited nuclear spins to obtain an NMR spin echo signal; and

(e) observing said NMR spin echo signal in the absence of all magnetic field gradients to obtain said NMR signal for Fourier transformation to yield information of the spatial distribution of chemical shift spectra in said predetermined region.

4,506,224
HIGH-FREQUENCY FIELD SYSTEM FOR NUCLEAR MAGNETIC RESONANCE APPARATUS

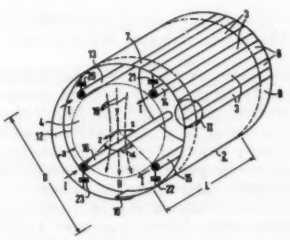
Norbert Krause, Heroldsbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 6, 1982, Ser. No. 405,727

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1981, 3133432

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—319 13 Claims



1. An apparatus for selectably generating a substantially homogeneous magnetic high-frequency field and receiving high-frequency signals in a nuclear magnetic resonance system, the apparatus having a plurality of conductor sections of predetermined length having first and second ends and spaced apart from a central axis and arranged parallel thereto, the conductor sections being each selectably coupled at one of said

ends thereof to one of a source of alternating high-frequency electric current and a receiver of alternating high-frequency electric current generated by a high-frequency voltage induced in said conductor sections and being arranged in at least one first pair so as to conduct alternating high-frequency electric current in opposite directions in each of the two conductors of said pair, the apparatus further comprising:

envelope means comprising electrically conductive material arranged so that said envelope means is impervious to high-frequency energy and permeable to low frequency energy, said envelope means being arranged concentrically with said central axis and at a predetermined distance from said conductor sections and about the conductor sections, said envelope means being selectably electrically coupled to said source of alternative high-frequency electric current and said receiver of alternating high-frequency electric current; and

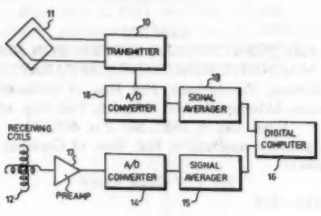
termination means coupled to the other of said ends of said conductor sections, said termination means electrically terminating said conductor sections and said envelope means so as to generate standing waves of said alternating high-frequency current in said conductor sections and said envelope means by reflecting said waves whereby an in-phase high-frequency magnetic field is developed by a conductor system formed by said envelope means and said at least one first pair of conductor sections.

4,506,225

METHOD FOR REMOTE MEASUREMENT OF ANOMALOUS COMPLEX VARIATIONS OF A PREDETERMINED ELECTRICAL PARAMETER IN A TARGET ZONE

Arthur J. Loveless, Esquessing Township, Canada, and Anthony R. Barringer, Golden, Colo., assignors to Barringer Research Limited, Toronto, Canada

Filed Dec. 28, 1981, Ser. No. 334,712
Int. Cl.³ G01V *3/08, 3/165, 3/16*
U.S. Cl. 324—334 **7 Claims**



1. A method of measuring anomalous complex variations of a predetermined electrical parameter in a target zone, comprising:

(a) generating a complex primary electromagnetic field and directing said primary field toward said target zone, said primary electromagnetic field being defined by a primary waveform of known shape and containing a plurality of frequency components appropriate to said target zone, said frequency components being of known frequencies, phase and relative amplitude, said primary electromagnetic field causing eddy currents to be induced in a conductive body present in said target zone, said eddy currents resulting in the formation of detectable secondary electromagnetic fields,

(b) receiving, by means of a receiving system that is positioned in the vicinity of said primary electromagnetic field, electromagnetic signals comprising a first component consisting of signals of substantially identical waveform to said primary waveform and a second component consisting of signals of a waveform that is different from said primary waveform, said second component including signals that are received during periods when said primary electromagnetic field is varying in time,

(c) generating a reference signal having a waveform similar to said primary waveform,

(d) periodically adjusting components of said reference signal so as to fit said reference signal to said first component of said received signals,

(e) subtracting said adjusted reference signal from said received signals so as to effectively reduce the effect of direct coupling of said receiving system with said primary field, and

(f) analyzing said received signals from which said adjusted reference signal has been subtracted to determine the existence of any anomalous variations in said predetermined parameter in said target zone.

4. A method of measuring anomalous complex variations of a predetermined electrical parameter in a target zone, comprising:

(a) generating a complex primary electromagnetic field and directing said primary field toward said target zone, said primary electromagnetic field being defined by a primary waveform of known shape and containing a plurality of frequency components appropriate to said target zone, said frequency components being of known frequencies, phase and relative amplitude, said primary electromagnetic field causing eddy currents to be induced in a conductive body present in said target zone, said eddy currents resulting in the formation of detectable secondary electromagnetic fields,

(b) receiving, by means of a receiving system that is positioned in the vicinity of said primary electromagnetic field, electromagnetic signals corresponding to the resultant of the primary and secondary fields sensed by said receiving system, including components of said secondary field detected when said primary field is varying in time,

(c) generating from said resultant on a periodic basis a receiving system impulse response function representing the response of said receiving system to a primary field of impulse shape,

(d) generating on said periodic basis a corresponding impulse response function representing the component of said receiving system impulse function attributable solely to direct coupling of said receiving system with said primary field,

(e) subtracting from said receiving system impulse function said corresponding impulse response function representing the said component attributable solely to direct coupling, and

(f) analyzing said receiving system impulse function from which said corresponding impulse function representing the said component attributable solely to direct coupling has been subtracted to determine the existence of any anomalous variations in said predetermined parameter in said target zone.

4,506,226

ION CONCENTRATION MONITOR

Robert S. Luce, Los Altos, and Ross A. Quinn, Los Altos Hills, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed May 19, 1982, Ser. No. 379,650
Int. Cl.³ G01N *27/62*
U.S. Cl. 324—459 **6 Claims**

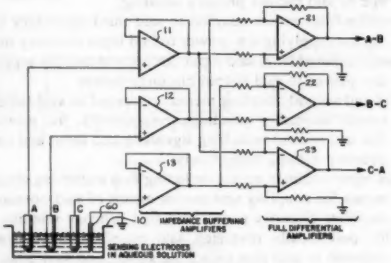
1. An apparatus for simultaneously monitoring ion concentrations for a plurality of different ions in an aqueous solution, said apparatus comprising:

(a) at least three electrodes insertable into said solution, at least two of said electrodes being ion-selective for particular ions;

(b) at least three electrical impedance bufers, each one of said electrodes being electrically connected to a corresponding one of said electrical impedance buffers, each electrical impedance buffer generating an electrical signal

indicative of electrical potential on the electrode to which the corresponding impedance buffer is connected; and

(c) a plurality of operational amplifiers disposed in full differential configuration, each differential operational amplifier being connected to receive inputs from a corresponding pair of said impedance buffers, each differential



operational amplifier generating a signal indicative of electrical potential difference between a corresponding pair of said electrodes so that the electical potential difference between any pair of ion-selective electrodes can be monitored, all of said differential operational amplifiers generating said signals simultaneously.

4,506,227

MASS SPECTROMETER

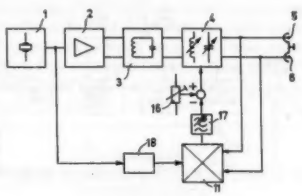
Raymond Heinen, Cologne, and Horst Stelling, Pulheim, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

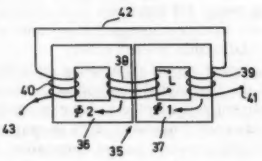
Filed May 20, 1982, Ser. No. 380,312

Claims priority, application Fed. Rep. of Germany, May 21, 1981, 3120196

Int. Cl.³ H03L *5/02*

U.S. Cl. 328—33 **5 Claims**





1. In a mass spectrometer having a resonant-circuit high-frequency electrical power supply for the operation thereof and at least one component which variably detunes the resonance of the circuit and thus the high frequency of the power supply and the operation of the mass spectrometer, the improvement comprising:

phase detector means for detecting the relative phase of the current and voltage of the power supply;

a transductor in the power supply for varying the resonance and thus the high frequency of the power supply in response to a magnetic flux; and

means responsive to the relative phase detected by the phase detector means and producing the magnetic flux in the transductor in a way which thereby varies the resonance and thus the high frequency of the power supply for retuning the latter.

4,506,228

DIGITAL FM DETECTOR

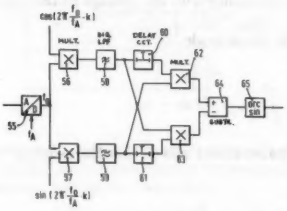
Karl-Dirk Kammeyer, Paderborn-Dahl, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,318

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138464; Dec. 12, 1981, 3149318; European Pat. Off., Jun. 21, 1982, 82 105 412.9

Int. Cl.³ H03K *9/04*

U.S. Cl. 329—107 **27 Claims**



1. Digitally operating demodulator for FM signals comprising:

means converting frequency modulated signals into digital form to provide digitalized signals;

means, including a pair of nonrecursive filters, for respectively converting said digitalized signals into a pair of signal sequences which are substantially Hilbert transforms of each other, said filters having an output digital word rate which is lower than the input digital word rate of the filters;

means for delaying the signals of each of said signal sequences;

means for digitally multiplying the signals of each of said signal sequences by the contemporaneous delayed signal of the other signal sequence to produce contemporaneous product signal pairs, and

means for producing the difference between each pair of product signals produced by said multiplying means.

4,506,229

FREE ELECTRON LASER DESIGNS FOR LASER AMPLIFICATION

Donald Prosnitz, Walnut Creek, and Abraham Szöke, Fremont, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 26, 1982, Ser. No. 342,679

Int. Cl.³ H01S *3/09*

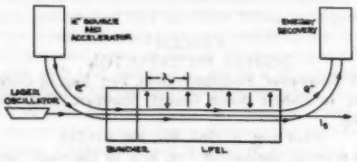
U.S. Cl. 330—4.3 **6 Claims**

1. A method for amplification of the optical radiation in a light beam of predetermined wavelength $\lambda_s = 2\pi/k_s = c/\omega_s$, local electric field strength E_s and normalized electric field strength $e_{s2} = E_s/\sqrt{2}mc^2$, where e is the unit of electron charge and mc^2 is electron rest energy, the method comprising the steps of:

providing a transverse wiggler magnetic field of alternating polarity along a predetermined z-axis, the magnetic field having local field strength B_w, normalized magnetic field

strength $b_w=eB_w/\sqrt{2}mc$ and local period $\pi_w=2\pi/k_w$, where the magnetic field variables b_w and k_w satisfy b_w/k_w=constant or k_w=constant or the alternating constancy condition throughout the range of interest of the axis coordinate z;

directing a collimated beam of electrons having relativistic



energy γmc^2 initially exceeding 1.5 MeV along the predetermined axis, with the electron beam power density being greater than the light beam power density;

directing the light beam along the predetermined axis in timed relationship with the passage of the electron beam; and

varying the phase angle

$$\psi = \int_0^z (k_w + k_s)\, dz - \omega_s t$$

along the predetermined axis so that the quantity

$$\frac{d}{dz}\left\{\left(\frac{4e_s b_w}{k_w^2}\right)^{\frac{1}{2}} \int_0^{\psi_{max}} [\cos\psi + \cos\psi_r - (\pi - \psi - \psi_r)\sin\psi_r]^{\frac{1}{2}}\, d\psi\right\} = A_1.$$

is substantially constant.

4,506,230

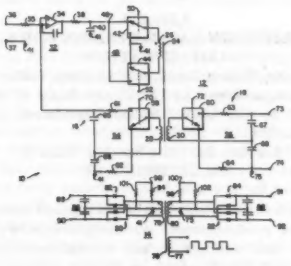
ISOLATION CIRCUIT

Charles D. Ashley-Rollman, Andover, Mass., assignor to Acrotechnology Corporation, Beverly, Mass.

Filed Nov. 7, 1983, Ser. No. 549,310

Int. Cl.³ H03F *3/38*

U.S. Cl. 330—10 **9 Claims**



1. An isolation circuit, comprising:

input circuitry means including operational amplifier circuitry having an input means for receiving an input signal, a feedback input means and an output means;

output circuitry means electrically isolated from said input circuitry means and including output terminal means;

signal transformer means having a first primary winding and first and second secondary windings;

power transformer means having a second primary winding and third and fourth secondary windings;

power input means for providing a square wave input voltage to said second primary winding;

rectifier-filter means coupled to said third secondary winding for supplying d.c. power to said input circuitry means;

means isolated from said input circuitry means for supplying d.c. power to said output circuitry means;

first and second coupling means connected to said third and fourth secondary windings, respectively, for providing first and second switching signals to said input and output circuitry means, respectively;

said input circuitry means including first switching circuitry means for coupling said output means of said operational amplifier circuitry across said first primary winding and for periodically reversing said coupling thereacross in response to said first switching signal; and said input and output circuitry means including second and third switching circuitry means, respectively, connected to said first and second secondary windings, respectively, for providing a signal to each of said feedback input means and said output terminal means, respectively, in response to said first and second switching signals, respectively.

4,506,231

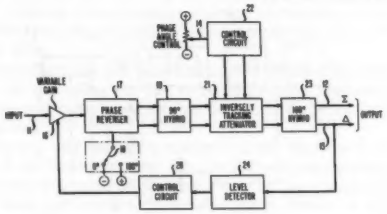
SINGLE ADJUSTMENT PHASE RESOLVER WITH CONSTANT AMPLITUDE OUTPUT

Donald R. Green, Jr., North Andover, Mass., and Charles O. Stevens, II, Plaistow, N.H., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 25, 1983, Ser. No. 555,286

Int. Cl.³ H03G *3/20;* G01R *25/04*

U.S. Cl. 330—129 **7 Claims**



1. A phase shifting circuit comprising:

signal splitting means for receiving an incoming signal and providing two signal components in substantially quadrature phase relationship to each other;

adjustable attenuator means comprising two sections, one for each of the two signal components, controlled by a single adjustment and adapted to have inversely tracking attenuation characteristics to produce an output indicative of a substantially constant vector summation of the two signal components as the relative magnitude between the two signal components is varied;

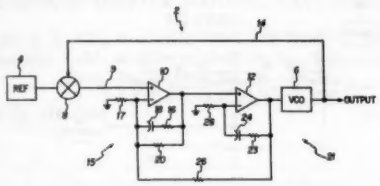
signal combining means for adding in specific phase relationship the two signal components from the two attenuator sections to produce a phase shifted output from the phase of the incoming signal in accordance with the relative magnitude relationship presented thereto; and

automatic gain adjustment means for sensing the magnitude of the phase shifted output and changing the magnitude of the incoming signal to maintain a constant output magnitude while its phase is varied.

4,506,232
THIRD ORDER PLL WITH INCREASED HIGH FREQUENCY GAIN

William J. Thompson, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 19, 1982, Ser. No. 399,536
Int. Cl.[3] H03L 7/08, 7/10
U.S. Cl. 331—16 2 Claims



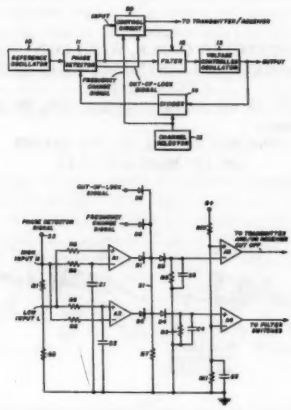
1. A phase-locked loop comprising:
an oscillator providing a reference signal,
a voltage controlled oscillator (VCO) providing a variable signal,
means for comparing the phases of the reference and variable signals to produce a difference signal at an output thereof,
and first and second amplifiers connected in series between the output of said phase comparing means and a frequency controlling input of said VCO, operative to provide decreasing loop gain with increasing frequency at the rate of about 18 db per octave within a bandwidth of the loop,
said first amplifier having a first input connected to said output of said phase comparing means, and an output connected in a feedback circuit comprising a first capacitor to a second input to said first amplifier,
said second amplifier having a first input connected to said output of said first amplifier, and an output connected to said input to said VCO and connected in a feedback circuit comprising a second capacitor to a second input to said second amplifier;
and further comprising feedback resistor means operative in combination with said amplifiers and said capacitors for providing said decreasing loop gain, said resistor means including a first resistor interconnecting said output of the second amplifier and said second input of the first amplifier.

4,506,233
BANDWIDTH CONTROL CIRCUIT FOR A PHASE LOCKED LOOP

Arvid E. Englund, Jr., Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Jun. 28, 1982, Ser. No. 392,566
Int. Cl.[3] H03L 7/10
U.S. Cl. 331—17 8 Claims

1. A control circuit for a phase locked loop having a reference oscillator, a controlled oscillator, a phase detector having inputs coupled to said oscillators, and a filter coupled between an output of said phase detector and a control input of said controlled oscillator, said control circuit comprising:
a. an input circuit having an output that produces a high voltage and an output that produces a low voltage, relative to each other, each being proportional to the voltage at said phase detector output;
b. first and second comparator circuits each having first and second inputs and an output;
c. means coupling said first input of said first comparator circuit to said low voltage output of said input circuit;
d. means coupling said second input of said second comparator circuit to said high voltage output of said input circuit;
e. a first delay circuit coupling said second input of said first comparator circuit to said high voltage output of said input circuit;
f. a second delay circuit coupling said first input of said second comparator circuit to said low voltage output of said input circuit;

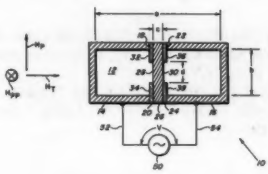


g. and output means coupled to said outputs of both of said first and second comparator circuits for producing a control signal for application of said filter.

4,506,234
AMPLITUDE AND PHASE MODULATION IN FIN-LINES BY ELECTRICAL TUNING

Carmine Vittoria, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 17, 1983, Ser. No. 505,569
Int. Cl.[3] H03C 7/02
U.S. Cl. 332—16 R 18 Claims



1. A fin-line waveguide device for modulating an electromagnetic signal passing therethrough comprising:
a waveguide including first and second channel members, said channel members longitudinally extending in the direction of signal progagation through said waveguide;
a ferrite dielectric slab disposed in said waveguide between said first and second channel members to approximately longitudinally bisect said waveguide, said ferrite slab electrically separating said first and second channel members, said ferrite slab being oriented in a longitudinally extending plane parallel to the electric field lines of said electromagnetic signal passing through said waveguide;
means for producing a magnetic field in said ferrite slab and for magnetically biasing said ferrite slab to approximately ferromagnetic resonance; and
means coupled to said ferrite slab for applying a voltage across said ferrite slab and for altering the ferromagnetic resonance characteristics of said ferrite slab in response to said voltage;

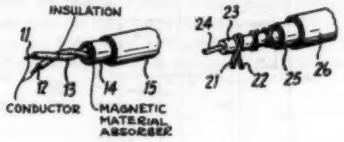
wherein the phase angle of said signal passing through said waveguide is modulated in response to said voltage.

4,506,235

EMI PROTECTED CABLE, WITH CONTROLLED SYMMETRICAL/ASYMMETRICAL MODE ATTENUATION

Ferdy Mayer, 43 rue du 11 novembre 1918, 94700 Maisons Alfort, France

Filed Feb. 23, 1982, Ser. No. 351,493
Int. Cl.[3] H01P *1/00, 3/02*
U.S. Cl. 333—12 5 Claims



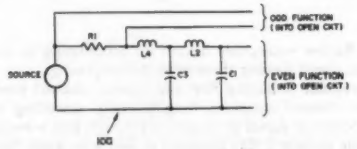
1. A cable with at least two insulated conductors, wherein said conductors are at least partially under the influence of an absorptive composite, so as to introduce absorption to the main propagation mode of the line, wherein the symmetrical mode electromagnetic field between the conductors is confined in a low loss dielectric medium in a controlled manner according to the characteristics of the insulating medium surrounding the conductors and globally surrounded at least partially by a magnetic absorptive insulating ferrite composite, attenuating primarily the asymmetrical current mode and providing a magnetic shielding effect against outside electromagnetic interference.

4,506,236

COMPOSITE FILTER/DIFFERENTIATOR

Robert L. Cloke, Santa Clara, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 15, 1982, Ser. No. 449,883
Int. Cl.[3] H03H *7/48, 17/00;* H03K *9/04*
U.S. Cl. 333—19 9 Claims



1. An open-ended composite filter/differentiator circuit which simultaneously produces an even function and an odd function of a transfer function supplied thereto in a read/write channel, comprising

energy source means,

resistance means connected to said source so as to develop the odd functions relative thereto, and

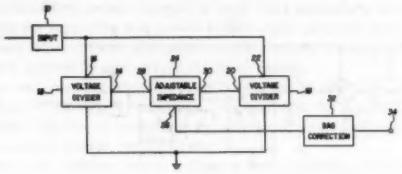
inductance means and capacitance means connected together to form an open-ended impedance network which is connected to said source means and to said resistance means so as to develop the even function across the open-ended portion of said network.

4,506,237

ADJUSTABLE SLOPE EQUALIZER

Lester T. Matzek, Lombard, Ill., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 30, 1982, Ser. No. 445,612
Int. Cl.[3] H04B *3/14;* H03H *7/03*
U.S. Cl. 333—28 R 9 Claims



1. An adjustable slope equalizer for maintaining a predetermined output level at a predetermined frequency, said equalizer comprising:

an adjustable input means having an operational amplifier means having an adjustable gain:

a first voltage divider means having an output and having an input operatively connected to said adjustable input means;

a second voltage divider means having an output and having an input operatively connected to said adjustable input means;

an adjustable high impedance means having an output and having at least two inputs operatively connected to said outputs of said first and second voltage divider means; and

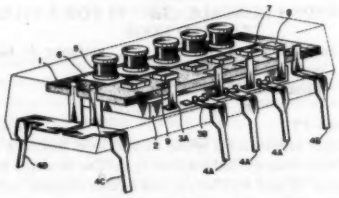
a sag correction means operatively connected to said output of said adjustable high impedance means; wherein an output of said sag correction means has a predetermined output voltage level at the predetermined frequency for any setting of said adjustable high impedance means.

4,506,238

HYBRID CIRCUIT DEVICE

Kunihisa Endoh, Kawagoe, and Yasumitsu Hayakawa, Urawa, both of Japan, assignors to Toko, Inc., Tokyo, Japan

Filed Dec. 10, 1982, Ser. No. 448,630
Claims priority, application Japan, Dec. 14, 1981, 56-18589[U]; Oct. 28, 1982, 57-163721[U]
Int. Cl.[3] H03H *7/32;* H05K *1/16*
U.S. Cl. 333—138 4 Claims



1. A hybrid circuit device comprising:

a flat package incorporating an integrated circuit therein;

a delay line circuit comprising a plurality of coils and a plurality of capacitors;

a base plate supporting said delay line circuit, said base plate being disposed on said flat package;

upwardly bent terminals led out of said flat package and connecting said delay line circuit and said integrated circuit to each other at side portions of said base plate;

non-bent terminals led out of said flat package;

separate terminals connected to said non-bent terminals respectively, said separate terminals being downwardly

bent in such a manner as to be led out in two rows, in the form of dual line package, holding said flat package therebetween; and

encapsulation surrounding said base plate and said package, with the free end portion of each of said separate terminals being exposed through said encapsulation.

4,506,239

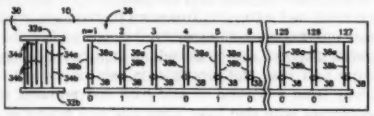
COMPOUND SURFACE ACOUSTIC WAVE MATCHED FILTERS

Frederick Y. Cho, Scottsdale, Ariz., and Dylan F. Williams, Berkeley, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 25, 1982, Ser. No. 436,204

Int. Cl.³ H03H *9/64, 9/145*

U.S. Cl. 333—196 **13 Claims**



1. A compound matched filter comprising:

a piezoelectric substrate;

a first transducer on said substrate, said first transducer being adapted to respond to an input electrical signal and to produce surface acoustic waves on said substrate, said surface acoustic waves being time expanded and one of frequency dispersed and phase coded with respect to said input electrical signal; and

a second transducer on said substrate, said second transducer being adapted to respond to said surface acoustic waves and to produce an output electrical signal, said output electrical signal being time expanded and phase coded with respect to said surface acoustic waves, an impulse response time of said first transducer being substantially equal to a bit time of said second transducer.

4,506,240

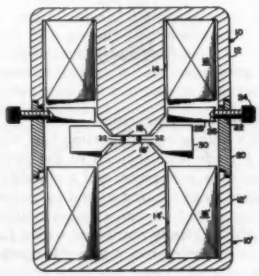
MAGNET ASSEMBLY FOR A YIG TUNED FILTER HAVING ADJUSTMENT MEANS TO ELASTICALLY STRAIN A POLE PIECE

David H. Shores, Lake Oswego, and Mark Whiting, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 1, 1982, Ser. No. 413,948

Int. Cl.³ H01P *1/218*

U.S. Cl. 333—202 **5 Claims**



1. A magnet assembly comprising first and second pole pieces having respective pole faces, first and second members rigidly connected to the first and second pole pieces respectively and so mounting the pole pieces with respect to each other that the pole faces are in generally parallel confronting relationship and define a pole gap therebetween, at least said first pole piece being resilient and having a support region which is spaced from said pole gap and by which said first pole piece is connected to said first member, and the assembly further comprising a mechanism for applying a force to said first pole piece at a location adjacent the pole face thereof and in a direction transverse to the distance between the pole pieces, whereby said first pole piece can be elastically strained about said support region in a direction transverse to said distance and the relative orientation of said pole faces is altered accordingly.

4. A ferrimagnetic resonator, comprising a magnet assembly according to claim 1, and at least two ferrimagnetic resonance elements disposed in said pole gap.

4,506,241

COAXIAL DIELECTRIC RESONATOR HAVING DIFFERENT IMPEDANCE PORTIONS AND METHOD OF MANUFACTURING THE SAME

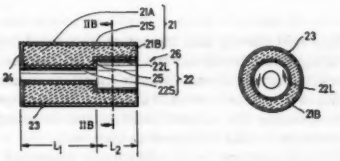
Mitsuo Makimoto, Yokohama; Yukichi Aihara, Kawasaki, and Sadahiko Yamashita, Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 30, 1982, Ser. No. 445,837

Claims priority, application Japan, Dec. 1, 1981, 56-193895

Int. Cl.³ H01P *7/04, 7/10*

U.S. Cl. 333—222 **13 Claims**



1. A coaxial dielectric resonators comprising:

(a) a generally hollow cylindrical dielectric having eliminating means for eliminating harmonics corresponding to integral multiples of a fundamental resonance frequency, said eliminating means having a thick dielectric portion, a thin dielectric portion, and a stepped dielectric portion interposed between said thick and thin dielectric portions, said thick dielectric portions having an impedance different from that of said thin dielectric portion so that an impedance ratio K therebetween is different from one to prevent resonance of said resonator at said harmonics;

(b) an outer conductor attached to the outer surface of said dielectric;

(c) an inner conductor attached to the inner surface of said dielectric; and

(d) a short-circuit plate attached to one end of said dielectric for making a short circuit between said outer and inner conductors.

4,506,242

TWIN-CIRCUIT BREAKER

Wolfgang Karpe; Johannes Kluge, both of Wetter, and Heinz Hasselmann, Hagen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,260

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211685

Int. Cl.³ H01H *47/16*

U.S. Cl. 335—120 **10 Claims**

5. A circuit breaker constructed in twin arrangement and comprising:

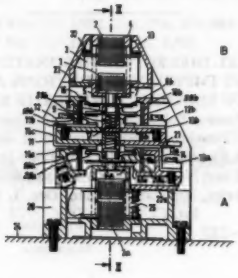
a case including a generally tubularly configured portion;

a first and second element of overall sleeve-like construction and being slidably disposed in said tubularly configured

porrtion of the case, each of said sleeves having bottom portions from which extend respectively sleeve like extension elements, the sleeve element of the first sleeve capable of abutting the sleeve extension element of the second sleeve to thereby define limit positions for each of said first and second sleeves;

movable armatures afixed to said first and second sleeves and respectively cooperating with stationary magnetic elements disposed within said sleeves;

U-shaped stationary contact carrier positioned in an orientation and mounted in the case so that its legs respectively



face said sleeves and having at its spaced legs contacts facing said sleeves and away from each other;

contact carrying circuit breaker members mounted in said sleeve like extensions and carrying contacts respectively cooperating for contact making and breaking with the contacts on said U-shaped carrier; and

additional contacts being electrically separated and being stationary disposed in general alignment with the legs of said U so that said movable contact elements provide circuit connections between the legs and said additional contacts.

4,506,243

ELECTROMAGNETIC CONTACTOR

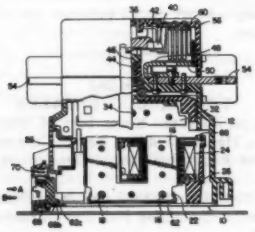
Hiroyuki Okado, Owariasahi; Masahiro Kakizoe, Kuwana; Shigeharu Otsuka, Gifu, and Yuji Sako, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,728

Claims priority, application Japan, May 28, 1981, 56-81448; Aug. 4, 1981, 56-122110; Aug. 4, 1981, 56-122111

Int. Cl.³ H01H *50/04*

U.S. Cl. 335—132 **8 Claims**



1. An electromagnetic contactor for controlling the closing and opening of an electric circuit, comprising:

a movable contact and a stationary contact opposed to each other and said movable contact being movable toward and away from a position in which it contacts said stationary contact;

a movable iron core connected to said movable contact for moving said movable contact;

a stationary iron core opposed to said movable iron core for driving said movable iron core in the direction of movement of said movable contact;

an operating coil disposed around said stationary iron core;

a base having an internal space for accommodating said stationary iron core and said operating coil and having an opening in the lateral portion thereof;

a rail means disposed in the bottom of said internal space;

a coil holder including a rail means engaging member for engaging said rail means for guiding said coil holder into and out of said internal space, said coil holder having said stationary iron core and said operating coil assembled thereonto, said coil holder having a cover mounted thereon, said cover engaging said base and closing said lateral opening when said coil holder with said operating coil and said stationary iron core thereon are moved into said internal space along said rail means, and a latch mechanism disposed on the outside of said cover facing away from said base and movable on said cover toward and away from a portion of said base and movable into engagement with said base when said coil holder is moved into a predetermined position on said base and said cover closes said lateral opening to prevent said coil holder from unintentionally coming out of said base and being movable out of engagement with said base when said coil holder is to be removed from said base.

4,506,244

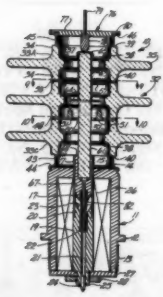
HIGH VOLTAGE RELAY

Hrair Jabagchourian, Carpenteria, and Louis Lucas, Jr., Santa Barbara, both of Calif., assignors to Kilovac Corporation, Santa Barbara, Calif.

Filed Jun. 7, 1984, Ser. No. 618,044

Int. Cl.³ H01H *1/66*

U.S. Cl. 335—151 **6 Claims**



1. A high-voltage relay, comprising:

a housing with a hollow coil-supporting base with a central pole piece, a guide tube secured to the base in coaxial alignment with the pole piece, and a plurality of stacked hollow ceramic rings secured to and extending from the base to a cover plate to define a sealed interior chamber;

a plunger assembly centrally positioned within the chamber, and having an insulating rod, a movable-contact conductive member secured to and extending along one end of the rod, and a ferromagnetic armature secured at the opposite end of the rod to extend into and make a slip fit within the guide tube;

a movable-contact terminal plate positioned between and sealed to an adjacent pair of ceramic rings and having a first external terminal and a central opening through which extends the conductive member, the plate supporting and being electrically connected to a pair of coil

springs extending across the central opening and slidably bearing on opposite side surfaces of the conductive member;

a return spring disposed between the pole piece and the armature for urging the armature away from the pole piece, whereby the armature is spring-urged to a first position when the coil is not energized, and magnetically drawn to a second position when the coil is energized; and

a first fixed contact secured to the housing and having a second external terminal, the fixed contact being in electrical connection with the conductive member in one of the positions to complete a circuit between the terminals.

4,506,245

REVERSING DEVICE WITH ELECTROMAGNETIC CONTROL AND MECHANICAL LOCKING

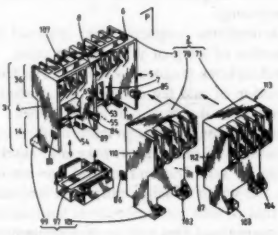
Gérard Lerude, Poitiers, and Jacques Lesoile, Mirebeau, both of France, assignors to La Telemecanique Electrique, France

Filed Feb. 14, 1983, Ser. No. 466,197

Claims priority, application France, Feb. 12, 1982, 82 02353

Int. Cl.³ H01H *9/26*

U.S. Cl. 335—160 **4 Claims**



1. An electromagnetic control device comprising:

(a) first and second substantially identical contactor units, the first contactor unit having a first plurality of switches and a first electromagnet including a first fixed yoke, a first coil and a first armature movable along a predetermined direction, the second contactor unit having second plurality of switches and a second electromagnet including a second fixed yoke, a second coil and a second armature movable along the said predetermined direction, each of the switches of the first and second plurality having stationary contacts and movable contact bridges; first and second contact carriers respectively coupling the first and second movable armatures to the movable contact bridges of the said first and second pluralities of switches; first and second sets of aligned terminals, each set including the terminals of a given polarity connected both to the first and second pluralities of switches;

(b) mechanical locking means comprising first and second levers mounted for pivoting in opposite directions and each having first and second ends, and means for coupling the respective first ends of the said levers to the first and second movable armatures respectively, whereby the respective lever is pivoted to an actuated position when the respective movable armature is displaced from a rest position to an actuated position, the second end of each lever being prevented from reaching its actuated position by the second end of the other lever when the said other lever is in its actuated position;

(c) a generally parallelepipedic half-casing having first and second side walls substantially parallel to said predetermined direction, an open face substantially at right angles to said side walls and a further wall opposite said open face, said side walls defining therebetween first, second and third adjacent, elongate volume portions, the second volume being located intermediate the first and third volume positions and delimited by an outwardly protruding surface portion of the said further wall; a plurality of insulating partitions outwardly and inwardly extending from the said further wall opposite the third volume portion, said insulating partitions which are substantially parallel to said side walls, outwardly defining a plurality of lodgings for the first set of terminals and inwardly defining a further plurality of lodgings; a central insulating partition inwardly extending from the said further wall substantially parallel to said side walls and dividing the internal volume of the half-casing into first and second housings each comprising half of the said first, second and third volume portions; and an aperture within said central insulating portion, said aperture opening on the said protruding surface portion;

(d) first and second means for respectively guiding the displacement of the first and second contact carriers within the first and second respective third half-volume portions and the displacement of the first and second armatures within the first and second respective second half-volume portions;

(e) means for pivotally mounting the first and second levers respectively in the cavities delimited by the said protruding surface portion within the two respective second-half volume portions, the second ends of the levers passing through the said aperture;

(f) means for mounting the first and second yokes and coils in the respective first and second halves of the first volume portion;

(g) first and second half-covers, each of generally parallelepipedic shape and having first and second side walls, an open face substantially at right angles with said walls and a further wall opposite said open face, solid side walls defining therebetween first, second and third adjacent elongate half-volume portions, the second half volume portion being located intermediate the first and third half-volume portions; a plurality of insulating partitions, outwardly and inwardly extending from the said further wall opposite the third half-volume portion, said insulating partitions which are substantially parallel to said side walls, outwardly defining a plurality of lodgings for the second set of terminals and inwardly defining a further plurality of lodgings, the said stationary contacts and the movable contact-bridges being housed in the further pluralities of lodgings of the said half-casing and of the first and second half-covers;

(h) means for attaching the first and second half-covers to the half casing, with the open faces of the respective half covers in engagement with the open face of the half-casing opposite the respective first and second housings; and the respective volume portion of the half-covers forming closed volumes with the respective volume portions of the half-casing and,

(i) fastening base means attached to the half-casing and the two half-covers, in the first volume portions thereof.

4,506,246

INTERLOCK SCHEME FOR HIGH AMPERAGE MOLDED CASE CIRCUIT BREAKER

Tak M. Wong, Swisher, Iowa, assignor to Square D Company, Palatine, Ill.

Filed May 9, 1983, Ser. No. 493,111

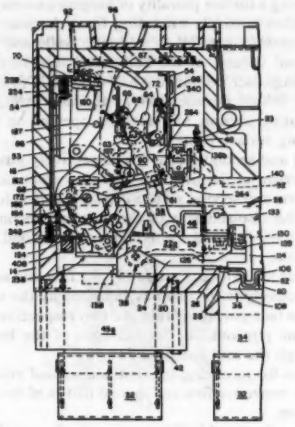
Int. Cl.³ H01H *3/30, 83/12*

U.S. Cl. 335—164 **12 Claims**

8. An interlock assembly for use in a circuit breaker having a tensed closing spring operably discharged by a manually operable spring discharge means for erecting a toggle assembly to move a plurality of blades from a contact open position to a contact closed position whereafter said toggle assembly is held erect and said blades are held in said contact closed position by a latch assembly adapted to be controlled for enabling collapse of said toggle assembly to effect movement of said blades from said contact closed position to a contact open position, the improvement comprising,

movable means biased in one direction for enabling operation of said spring discharge means,

and preventing means automatically operable for preventing movement of said movable means in said one direction in



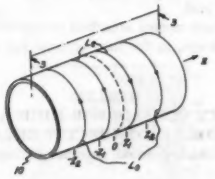
response to said bias to prevent operation of said spring disharge means and discharge of said closing spring in response to either the control of said latch for enabling release of said toggle assembly or the movement of said blades to a contact closed position.

4,506,247

AXISYMMETRIC CORRECTION COIL SYSTEM FOR NMR MAGNETS

Mark E. Vermilyea, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 23, 1984, Ser. No. 612,966
Int. Cl.³ H01F 7/22
U.S. Cl. 335—216 **7 Claims**



1. A correction coil system for improving the homogeneity of the axial component of a magnetic field within a cylindrical volume, said system comprising:

a cylindrical form at least partially defining said volume;

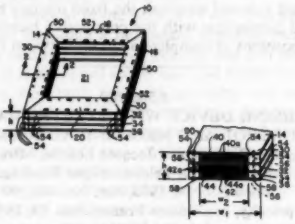
a plurality of axisymmetric coil pairs disposed on said form at selected positions along the longitudinal extent of said form, said positions being selected so that at least one of said axisymmetric coil pairs function so as not to contribute to the n^{th} term of the spherical harmonic expansion representing the axial component of the magnetic field produced by said coil pair, where $n \neq 0$ and $n \neq 1$.

4,506,248

STACKED AMORPHOUS METAL CORE

Kou C. Lin, Hermitage, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 19, 1983, Ser. No. 533,513
Int. Cl.³ H01F 27/24
U.S. Cl. 336—233 **26 Claims**



1. A stacked magnetic core for an electrical induction apparatus, comprising:

a non-amorphous magnetic strip material forming a first lamination of a leg or yoke of said core;

a non-amorphous magnetic strip material forming a second lamination of said leg or yoke and spaced from said first lamination to define a gap therebetween;

an amorphous magnetic strip material forming a plurality of laminations of said leg or yoke and stacked in said gap defined by said first and second non-amorphous laminations, the width of said amorphous laminations being less than that of said non-amorphous laminations; and

means joining said first and second non-amorphous laminations to support said non-amorphous and amorphous laminations of said core.

4,506,249

FUSE ELEMENT TERMINATION FOR CURRENT-LIMITING FUSE

William J. Huber, Waukesha, and Gordan T. Borck, Cudahy, both of Wis., assignors to RTE Corporation, Waukesha, Wis.

Filed Sep. 8, 1983, Ser. No. 530,403
Int. Cl.³ H01H 85/16
U.S. Cl. 337—232 **7 Claims**

1. A current-limiting fuse comprising: a hollow insulating housing having a longitudinal axis;

electrically conductive end cap assemblies secured to opposite ends of said housing;

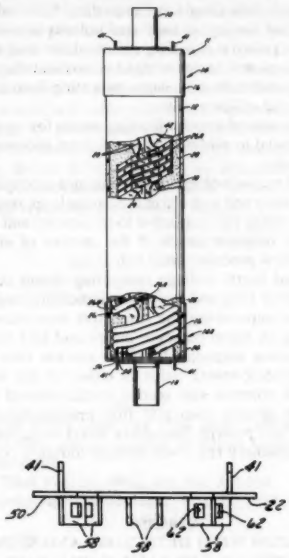
a dielectric assembly; electrically conductive metallic terminator plates connected at opposite ends of said dielectric assembly and disposed within said hollow insulating housing with each terminator plate being disposed transversely of said axis and electrically and mechanically connected to an associated end cap assembly, each of said plates having one surface confronting an associated end cap assembly and an opposite surface;

at least one of said terminator plates having integrally formed means on said one surface in electrical contact with said associated end cap assembly and having at least one integrally formed arcing electrode extending axially from said opposite surface;

and at least one fusible element helically wound on said dielectric assembly and having the opposite ends thereof electrically and mechanically secured to said terminator plates;

said fusible element having an end portion folded around in

fixed position and in electrical contact with said arcing electrode and extending through a hole in said one terminal plate and electrically and mechanically connected by welding in said fixed position to said one terminator plate.



4,506,250
STRAIN GAUGE

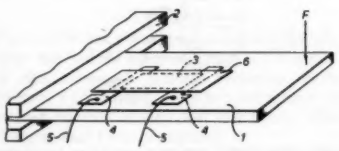
Peter L. Kirby, Newcastle upon Tyne, England, assignor to Crystalate Electronics Limited, Kent, England

Filed May 12, 1982, Ser. No. 377,486

Claims priority, application United Kingdom, May 16, 1981, 8115089

Int. Cl.³ G01L *1/22*

U.S. Cl. 338—5 **21 Claims**



1. A force measuring transducer comprising:

a low deformation supporting member to which is applied the force to be measured, said supporting member having an electrically isolated surface;

an electrical resistance element in the form of an elongated film coated directly onto said isolated surface of said supporting member so that its electrical resistance varies as a function of longitudinal tensile and compressive strain therein resulting from mechanical strain induced in the supporting member, said film having an electrical resistance of from 100 ohms to 10,000 ohms per square and comprising conducting particles in a polymerized organic resin, said electrical resistance element having been heated to a temperature from 100° C. to 250° C. to polymerize the resin and electrically stabilize the film; and

electrical film conductors coated directly onto said isolated surface of said supporting member and defining terminals leading from opposed ends of said resistance element to provide electrical contact thereto.

4,506,251
SHEATHED RESISTANCE HEATER

Noboru Naruo, and Hidekata Kawanishi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

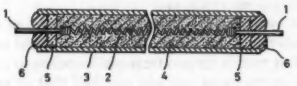
PCT No. PCT/JP82/00172, § 371 Date Jan. 18, 1983, § 102(e) Date Jan. 18, 1983, PCT Pub. No. WO82/04172, PCT Pub. Date Nov. 25, 1982

PCT Filed May 17, 1982, Ser. No. 459,526

Claims priority, application Japan, May 19, 1981, 56-76231; May 20, 1981, 56-77181

Int. Cl.³ H01C *1/03*

U.S. Cl. 338—238 **5 Claims**



1. A sheathed resistance heater comprising an electrical metal heating wire received in a metal pipe, and an electrically insulating powder composition filling the remainder of the metal pipe, said insulating power composition comprising at least one electrically insulating powder uniformly mixed with at least one metallic powder selected from the group consisting of nickel, cobalt, iron, niobium, tungsten and yttrium, so that said heating wire is insulated from said metal pipe by said insulating powder composition and said at least one metallic powder suppresses the evaporation of metal components in the heating wire.

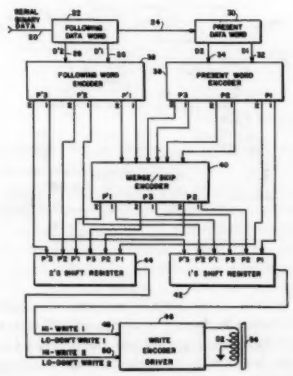
4,506,252
TERNARY DATA ENCODING SYSTEM

George V. Jacoby, Los Altos, Calif., and Martin Cohn, Arlington, Mass., assignors to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 260,248, May 5, 1981, abandoned. This application Jul. 5, 1983, Ser. No. 511,044

Int. Cl.³ H04L *3/00*

U.S. Cl. 340—347 DD **13 Claims**



1. A two level ternary encoding system for converting binary data consisting of a series of binary data bits into a series of corresponding ternary code signals each representative of ternary 0 code symbol, a ternary 1 code symbol or a ternary 2 code symbol, and for producing said ternary code signals in

intervals each interval including a code signal position, said encoding system comprising:

data storage means having an input and an output, said data storage means for receiving at a first clock rate a binary data word and a following binary data word each data word including at least two binary data bits,

first encoding means coupled to the output of said data storage means for simultaneously receiving said binary data word and said following binary data word and for producing groups of three corresponding code signals for each two bit binary data word and following data word each code signal representative of a ternary code symbol and associated with a discrete code signal position,

second encoding means coupled to the output of said first encoding means for re-encoding certain predetermined ones of said code signals into code signals in which signals, other than those representative of a ternary 0 symbol, are separated by a predetermined minimum and a maximum number of said intervals, and

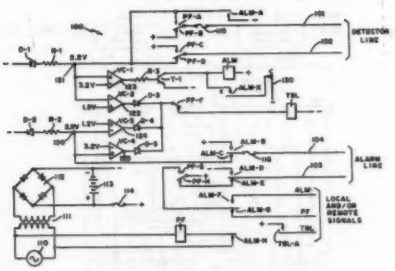
ternary code symbol generating means coupled to receive code signals from said first encoding means and said second encoding means for producing in response to a second clock rate operating at one and one-half that of said first clock rata and within an interval including a code signal position a plurality of transitions between first and second signal levels in response to a code signal representative of one of said ternary 1 and 2 code symbols, producing in a different interval including a code signal position a single transition between the first and second signal levels in response to a code signal representative of the other one of said ternary 1 and 2 code symbols, and an absence of any signal change between the first and second signal levels within an interval in response to code signal representative of a ternary 0 code symbol.

4,506,253

SUPERVISORY AND CONTROL CIRCUIT FOR ALARM SYSTEM

Irving Mande, Westport; Robert W. Right, Huntington, and George W. Killian, Stamford, all of Conn., assignors to General Signal Corporation, Stamford, Conn.

Filed Jan. 3, 1983, Ser. No. 455,075
Int. Cl.[3] G08B *29/00*
U.S. Cl. 340—506 **16 Claims**



1. An alarm system comprising in cooperative combination:

(a) a control station including a source of DC potential;

(b) a detector loop containing at least one polarity insensitive initiating device which may contain an auxiliary relay, said polarity insensitive device detects abnormal conditions, said detector loop is coupled to said control station and has said polarity insensitive device bridged across said detector loop and with said detector loop terminated with a polarity sensitive end of line resistor so that when said system is operating during a power failure the consequential line reversal does not inhibit subsequent said initiating devices;

(c) an alarm indicating loop extending from said control station and having at least one polarity sensitive audio alarm, a polarity sensitive, visual alarm and a polarity sensitive control device bridged across said alarm indicating loop and with said alarm indicating loop terminated with an end-of-line resistor;

(d) first and second current limiting means for coupling said DC potential to said detector and alarm indicating loops, respectively;

(e) first and second voltage comparing means coupled to said detector loop and said alarm indicating loop, respectively, for supervising the respective loop currents and actuating a trouble response means if the current of either falls below a first predetermined value; and

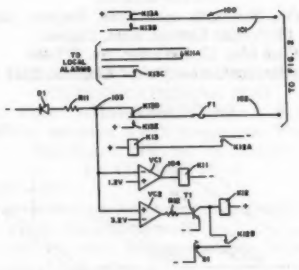
(g) third and fourth voltage comparing means coupled to said detector loop and said alarm indicating loop, respectively, for supervising the respective loop currents and activating an alarm response means and said trouble response means, respectively, if the current rises above a second predetermined value in either of the respective loops and wherein said second predetermined value of current is greater than said first predetermined value, whereby said polarity insensitive alarm initiating devices and said auxiliary relay will operate during a power failure.

4,506,254

ALARM SYSTEM WITH DETECTORS AND SIGNALING DEVICES ON THE SAME CABLE PAIR

Robert W. Right, Huntington, and Irving Mande, Westport, both of Conn., assignors to General Signal Corporation, Stamford, Conn.

Filed Nov. 10, 1982, Ser. No. 440,643
Int. Cl.[3] G08B *29/00*
U.S. Cl. 340—510 **11 Claims**



1. A single zone alarm system comprising in cooperative combination:

(a) a control station;

(b) a cable pair coupled to said control station and extending therefrom to a supervised zone;

(c) a DC power supply at said control station coupled to said cable pair with a predetermined polarity;

(d) trouble condition identifying means at said control station coupled to said cable pair for supervising the magnitude of current in said cable pair and indicating a troubled condition when the current in said cable pair falls below a first predetermined value;

(e) alarm condition indicating means at said control station coupled to said cable pair for supervising the magnitude of current in said cable pair and indicating an alarm condition when the current in said cable pair rises above a second predetermined value which is greater than said first predetermined value;

(f) said alarm condition reverses the polarity of potential applied to said cable pair;

(g) one or more polarity sensitive alarm indicating devices bridged across said cable pair in said supervised zone for responding to said reverse polarity to provide audio/-visual signals and/or activate associated devices; and

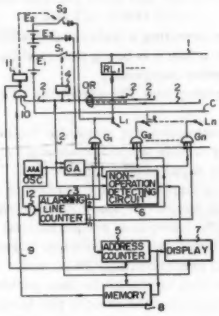
(h) one or more polarity insensitive alarm initiating devices bridged across said cable pair in said supervised zone for responding to predetermined abnormal conditions by reducing the impedance of said polarity insensitive alarm initiating device from a high to an intermediate value whereby to increase the line current in said cable pair above said second predetermined value.

4,506,255

OPERATION TEST CIRCUIT FOR FIRE DETECTORS

Isao Sasaki, Tokyo, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed Feb. 24, 1982, Ser. No. 351,914
Claims priority, application Japan, Feb. 25, 1981, 56-25494
Int. Cl.³ G08B *29/00*
U.S. Cl. 340—514 **11 Claims**



1. A test circuit for fire alarm systems and the like of a type in which first and second electrical lines are bridged by a plurality of detectors, each detector becoming conductive upon detection of a condition such as fire and upon receipt of a predetermined number of electrical test pulses which are transmitted across said lines, comprising:

means for generating test pulses and supplying them to the detectors;

means for generating an alarm signal when said lines are connected together by at least one conductive detector, said generating means being connected to said first line;

means for disabling said generating means, said disabling means being connected in series with said generating means;

a first circuit for producing a confirmation signal when said lines are connected together by a conductive detector;

a delay circuit for delaying production of said confirmation signal for a predetermined period of time after said lines are connected together by a conductive detector; and

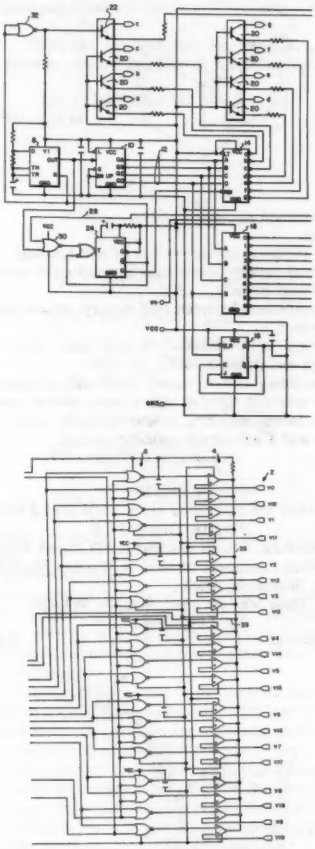
a second circuit for deactivating said disabling means in response to production of said confirmation signal, whereby generation of an alarm signal by said generating means is permitted.

4,506,256

ANNUNCIATOR CONTROL CIRCUIT

Luther L. Genuit, Scottsdale, and John R. Nowell, Phoenix, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Apr. 7, 1982, Ser. No. 366,128
Int. Cl.³ G08B *26/00*
U.S. Cl. 340—518 **10 Claims**



1. An annunciator for indicating the status of a plurality of components of a system, said annunciator comprising:

indicator means of the type capable of displaying numerical digits in accordance with the energization thereof;

a plurality of component status signal lines connected, respectively, to report the status of said components;

a control circuit coupled to control the selective energization of said indicator means in response to certain status signals applied to said signal lines;

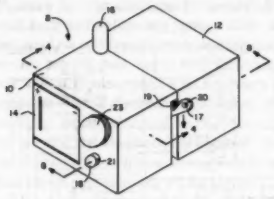
said control circuit including timing means and scanning means controlled by said timing means for sequentially scanning said status signal lines to detect the presence of said certain status signals thereon; and

said control circuit further including means responsive to the detection of said certain status signal to energize said indicator means to display a number representative of the component from which said certain status signal was derived on said status signal line.

4,506,257
PORTABLE ALL PURPOSE ELECTRICAL ALARM

Joseph M. Roberts, Sr., P.O. Box 2383, Alameda, Calif. 94501

Filed Dec. 23, 1982, Ser. No. 452,428
Int. Cl.[3] G08B *19/00*; H01H *3/02*
U.S. Cl. 340—521 9 Claims

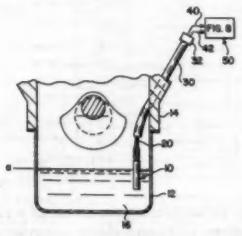


1. An electrical alarm comprising
a housing,
a buzzer mounted in one portion of said housing,
an electrical battery power source mounted in another portion of said housing,
a plate positioned between said battery power source and said buzzer,
an electrical light mounted on said plate and extending through said housing, and
means including switch means electrically connecting said buzzer and said light to said battery power source, said switch means including a first rotatable lever actuated switch and a second pin actuated switch.

4,506,258
SYSTEM FOR DETECTING LOW LIQUID LEVEL AND PROBE THEREFOR

Ben J. Charboneau, Wixom, and Richard D. Zerod, Union Lake, both of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed May 20, 1982, Ser. No. 380,429
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—618 43 Claims

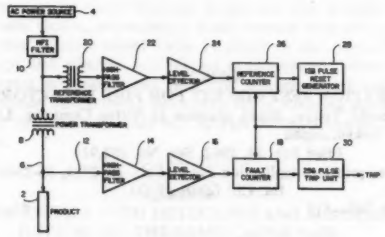


1. In a system for actuating a warning device when the level of a liquid in a receptacle is below a preselected level, said system including a probe formed from a length of positive temperature coefficient wire whereby the resistance across said wire increases with increased wire temperature, means for mounting said probe in said receptacle with said wire being normally in said liquid and being at least partially out of said liquid when said liquid is below said preselected level, means for mounting said wire in a circuit, first switching means for applying a voltage across said circuit and detector means for actuating said warning device in response to the condition of a control point in said circuit, the improvement comprising: said detector means including a detector with an input and an output which creates a warning signal when said input reaches a preselected voltage, a capacitor connected between the input of said detector and said control point, second switching means for grounding said capacitor for a preselected first time cycle whereby said capacitor is charged rapidly toward the voltage of said control point for said preselected first time cycle and means for operating said first switching means for a second time cycle, said second time cycle being generally coextensive with said first time cycle initially and substantially longer in duration.

4,506,259
DIGITAL FAULT MONITOR FOR CONDUCTIVE HEATERS

Thomas R. Rhodes, Fremont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 24, 1981, Ser. No. 324,470
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—640 19 Claims



1. Apparatus for detecting a fault condition in an electrically conductive device while it is being powered by an AC power supply, said apparatus comprising
(1) means for connecting the apparatus to the AC power supply;
(2) means for connecting the apparatus to the device; and
(3) a comparator which, when the apparatus is connected to the AC power supply and to the device,
(a) counts, over successive time periods of predetermined duration, the number of times that electrical noise in the power supply exceeds a predetermined level and the number of times that the electrical noise in the device exceeds said predetermined level, and
(b) indicates when, in any given time period, the counted number of times that the noise in the device exceeds said predetermined level is greater, by at least a predetermined number, than noise in the power source exceeds said predetermined level.

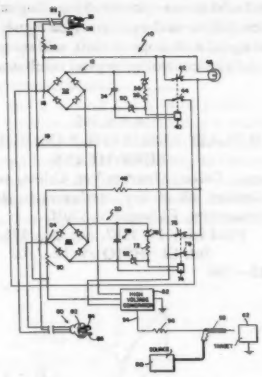
4,506,260
GROUND ASSURANCE CIRCUIT

Frederick W. Woodruff; Daniel C. Hughey, and William L. Smart, all of Indianapolis, Ind., assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Mar. 15, 1982, Ser. No. 357,844
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—649 10 Claims

1. A system for ensuring that a ground connection is made in a three-wire conductor system including a line "hot" conductor, a line neutral conductor, and a ground conductor including:
means for utilizing current flowing between the line "hot" conductor and the line neutral conductor;
a first circuit for coupling the utilization means to the "hot" and neutral conductors, the first circuit including a first switch;
a second circuit for sensing the potential between the "hot" conductor and the ground conductor, the second circuit including a Zener diode for switching in response to the presence of voltage across the second circuit tending to

indicate the presence of ground potential and means for operating the first switch when the Zener diode switches



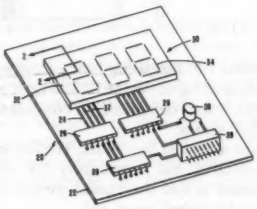
to couple the utilization means to the "hot" and neutral conductors.

4,506,261

INTEGRATED GAS DISCHARGE DISPLAY PANEL

Raymond L. Lawter, Zanesville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 28, 1982, Ser. No. 392,432
Int. Cl.[3] G09G *3/14*
U.S. Cl. 340—718 **4 Claims**



1. A gaseous display device comprising:

a printed circuit board member having at least one surface of insulating material;

a row of first electrical conductors located in said surface of insulating material and having one end portion being operated as a cathode electrode of a predetermined gas discharge pattern;

a transparent cover having an inside surface mounted to one side of said insulating surface of the printed circuit board member enclosing said cathode electrodes and forming an air-tight chamber between the inside surface of the cover and the surface of the insulating material and filled with an ionizable gas capable of sustaining a gas discharge;

a plurality of second electrical conductors located in said surface of insulating material and extending to a position within the chamber formed by said transparent cover;

a column of third electrical conductors disposed on said inside surface of the transparent cover within said chamber and operated as the anode electrode of a predetermined gas discharge pattern;

means mounted entirely within said chamber for interconnecting said second and third electrical conductors;

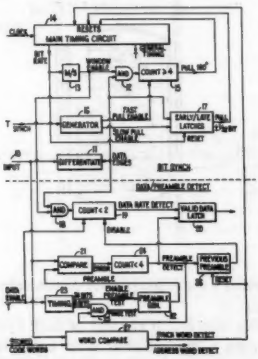
and electrical control means mounted on said printed circuit board adjacent said cover and engaging said first and second electrical conductors for generating control signals operating selected anode and cathode electrodes to produce a predetermined gas discharge pattern within said chamber of said display device.

4,506,262

SYNCHRONIZATION OF DIGITAL RADIO PAGER

Ian A. W. Vance, Newport; Colin Jeffrey, Stansted Mountfitchet; Brian A. Bidwell, Luton; David F. A. Leevers, Harlow, and Michael J. A. Woodley, Hitchin, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 15, 1982, Ser. No. 398,472
Claims priority, application United Kingdom, Jul. 27, 1981, 8123063
Int. Cl.[3] H04Q *9/00*; H04B *1/16*
U.S. Cl. 340—825.44 **17 Claims**



1. A control arrangement for a digital radio pager receiver comprising:

a timing control circuit;

first means coupled to said control circuit and incoming data signals for periodically establishing bit synchronization of said receiver to said incoming data signals by adjusting said control circuit within a first predetermined number of data bit periods;

second means coupled to said control circuit and to said first means to determine reception of valid data bits during a second predetermined number of data bit periods immediately succeeding said first bit periods;

third means coupled to said incoming signals and said control circuit to compare incoming bits patterns with locally generated bit sequences during said second bit periods, said second means and said third means operating simultaneously during said second bit periods; and

fourth means coupled to said second means and to said third means and responsive to a position output from said second and third means to produce a control signal to continue the operation of said receiver for a further period of time and to a negative output from said second and third means to discontinue the operation of the receiver for a predetermined period of time.

4,506,263

DATA TRANSMISSION SYSTEM FOR LOGGING TOOLS

Feroze J. Sidhwa, Coppell, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 19, 1981, Ser. No. 265,130
Int. Cl.[3] G01V *1/40, 5/12*
U.S. Cl. 340—856 **2 Claims**

1. In a well logging system having a plurality of detectors which supply data to counters, a power source, a memory with data bytes consisting of a plurality of data bits and a plurality

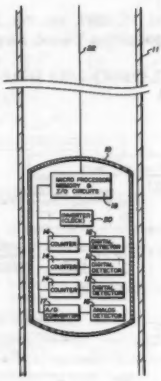
of input/output ports, a method of collecting and transmitting data comprising:

loading said data from said counters into said memory;

determining the serial position of data transmission with respect to the number of bytes transmitted and the number of bits transmitted;

transmitting a start bit whenever said transmission position is the first bit of a byte of information;

transmitting a plurality of bits of information for each byte of said data;



decrementing a bit counter after transmission of each bit of information;

transmitting stop bits at the end of each byte of data;

decrementing a byte counter after each transmission of a byte of data;

detecting completion of serial transmission by the absence of data; and

repeating said transmission of said data bytes and transmission of said data bits at predetermined intervals.

4,506,264

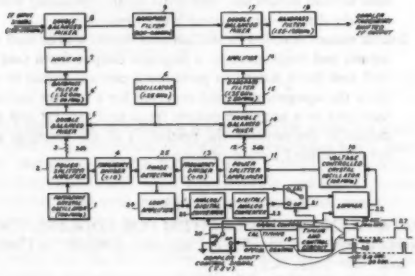
FREQUENCY TRANSLATOR

Warren D. Bogert, Fort Lee; Marvin L. Kiss, Nutley, both of N.J., and Gin W. Yee, Flushing, N.Y., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 26, 1978, Ser. No. 872,419

Int. Cl.³ G01S *7/36, 7/42;* **H01Q** *15/18, 17/00*

U.S. Cl. 343—18 E **10 Claims**



1. A frequency translator to generate from an input signal having a frequency in a given bandwidth an output signal having a frequency with doppler shift in said given bandwidth comprising:

first means including a reference crystal oscillator to frequency down-convert said input signal; and

second means coupled to said first means to frequency up-convert said down-converted input signal and to impart a doppler shift to said up-converted signal to generate said output signal with doppler shift, said second means including a voltage controlled crystal oscillator.

4,506,265

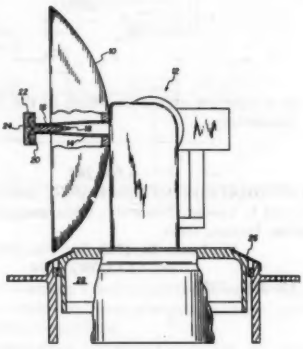
NUCLEAR BLAST RESISTANT PARABOLIC ANTENNA FEED MEANS

Ted A. Dumas, Dallas; Maarten Vet, Celina, and Sam K. Buchmeyer, Garland, all of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 19, 1983, Ser. No. 496,079

Int. Cl.³ H01Q *19/19, 1/02*

U.S. Cl. 343—704 **4 Claims**



2. Apparatus for dissipating heat generated by the concentration of infrared signals at the focal area of a parabolic reflector RF antenna feed comprising in combination:

splash plate means;

feed means including waveguide portion means;

heat conductive, but substantially RF signal transparent, plug means in said waveguide portion means of the feed adjacent the splash plate; and

means for bonding the plug to both said waveguide portion means and said splash plate means for facilitating heat transmission from said splash plate means to said waveguide portion means.

4,506,266

ANTENNA APPARATUS FOR VEHICLE-MOUNTED RECEIVER/TRANSMITTER EQUIPMENT WITH AUTOMATIC ANTENNA LENGTH CONTROL

Masataka Mizuno; Tatsuo Ito; Shuji Sugawara, all of Hyogo; Masakazu Moriyama, Aichi; Masahito Muto, Aichi, and Shuji Nakane, Aichi, all of Japan, assignors to Fujitsu Ten Limited, Kobe, Japan

Filed Oct. 21, 1982, Ser. No. 435,881

Claims priority, application Japan, Oct. 22, 1981, 56-169740

Int. Cl.³ H01Q *1/32*

U.S. Cl. 343—715 **1 Claim**

1. An antenna control apparatus for a vehicle-mounted variable length antenna utilized with at least first and second electrical devices, said antenna control apparatus comprising:

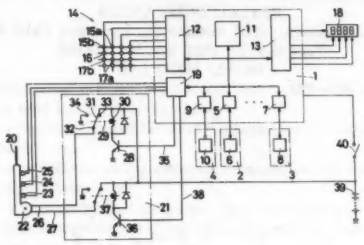
a power source for providing power to said apparatus:

a main switch and a processor means, said main switch operatively connected between said processor means and said power source for controlling the power tranmitted therebetween;

a motor mechanically connected to said antenna for varying the length thereof;

a motor drive operatively electrically connected to said motor for providing power thereto, said motor drive operatively electrically connected to said power source for receiving power therefrom and connected to said processor means for receiving control signals so as to operate in response thereto;

at least a first and a second and a third position detector, each of said position detectors detecting a specific length of said antenna, said first and second detectors detecting first and second lengths corresponding to first and second frequencies for which said antenna is of an optimum length and said third detecting means detecting a length of said antenna corresponding to said antenna being withdrawn into said vehicle;



a function switch connected to said processor for providing control input signals thereto;

a third electrical device operatively connected to said processor means, said third device not requiring the use of said antenna;

wherein, when said function switch selects said third electrical device or said power source is opened, said motor causes said antenna to be withdrawn into said vehicle;

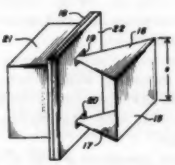
and wherein when said function switch respectively selects said first and second electrical devices, said motor causes said antenna to respectively have said first and second lengths corresponding to said first and second frequencies, said first and second frequencies respectively being frequencies being utilized by said first and second electrical devices.

4,506,267

FREQUENCY INDEPENDENT SHIELDED LOOP ANTENNA

Henning F. Harmuth, Potomac, Md., assignor to Geophysical Survey Systems, Inc., Hudson, N.H., a part interest

Filed Jan. 26, 1983, Ser. No. 461,153
Int. Cl.³ H01Q *11/04*
U.S. Cl. 343—744 **3 Claims**



1. An antenna for producing electric dipole radiation, comprising

(a) electrically conductive means forming a loop, one portion of the loop being a radiator leg for radiating electromagnetic wave energy,

(b) a current source for driving a current around the conducting loop,

(c) shield means for confining radiation from the current source and that portion of the loop opposite the radiator leg, the shield means being disposed around the current source and that portion of the loop opposite the radiator, and

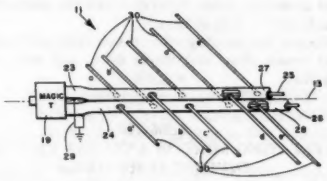
(d) adsorbing material on the shield means, the absorbing material absorbing energy from surface currents induced in the shield means by radiation from the radiator leg.

4,506,268

LOG-PERIODIC ANTENNA

Samuel C. Kuo, Saratoga, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 309,874, Oct. 9, 1981, abandoned. This application Oct. 3, 1983, Ser. No. 538,353
Int. Cl.³ H01Q *11/10*
U.S. Cl. 343—792.5 **13 Claims**



1. A log-periodic antenna comprising a pair of arrays of radiating elements arranged in a frequency independent manner in E-planes for having substantially reduced gain dropout, each array having an axis and comprising:

first and second sets of said elements, the elements of each of said sets being axially spaced apart and having dimensions and interelement spacings which decrease from a maximum at one end to a minimum at the other end in increments at a predetermined ratio, and

balanced feed means for energizing said elements, said feed means comprising first and second coaxial cables, each of said cables having an inner conductor and an outer conductor that is electrically connected to a ground reference potential,

said first set of elements being electrically connected to the inner conductor of said first cable,

said second set of elements being electrically connected to the inner conductor of said second cable, and

axially successive elements of each of said sets projecting in opposite directions from the axis,

the first sets of elements of said arrays being substantially coplanar,

the second sets of elements of said arrays being substantially coplanar.

4,506,269

LAMINATED THERMOPLASTIC RADOME

Edward E. Greene, Barton, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 26, 1982, Ser. No. 382,070
Int. Cl.³ H01Q *1/42*
U.S. Cl. 343—872 **6 Claims**

1. A radome wall for use in a radome of a supersonic aircraft, said radome being substantially resistant to rain erosion, said radome having a C-sandwich construction, said radome wall comprising:

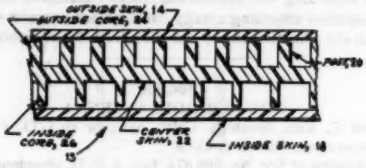
an outside skin, said outside skin composed of a thermoplastic selected from a group consisting of polyarylate, polycarbonate, polyetherimide, and polysulfone;

a center skin, said center skin composed of said thermoplastic;

an inside skin, said inside skin composed of said thermoplastic;

an outside core between said outside and said center skins, said outside core composed of said thermoplastic;

an inside core between said center and said inside skin, said



inside core composed of said thermoplastic and structurally similar to said outside core, said outside and said inside cores comprising a plurality of periodic structures, said structures being posts or tubes and substantially perpendicular to said skins; and

an adhesive for bonding said outside skin, said outside core, said center skin, said inside core, and said inside skin together.

4,506,270

REFLECTING MIRROR ANTENNA UNIT WITH DIVERSE CURVATURE

Takashi Katagi; Shigeru Makino; Hirokazu Tanaka, and Yuji Kobayashi, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP81/00372, § 371 Date Oct. 12, 1982, § 102(e) Date Oct. 12, 1982, PCT Pub. No. WO82/02120, PCT Pub. Date Jun. 24, 1982

PCT Filed Dec. 8, 1981, Ser. No. 440,220

Claims priority, application Japan, Dec. 10, 1980, 55-174081

Int. Cl.³ H01Q *15/14*

U.S. Cl. 343—914 **2 Claims**

1. An antenna unit with a reflecting mirror characterized in that the surface of a reflecting mirror is divided into a plurality of parts and the parts are made different in thickness by t_n from one another, the t_n being defined by

$$t_n = \frac{1}{2k\cos\theta_n} \cdot \Phi_n'$$

where k is the wave number, θn is the incident angle of a radio wave to said reflecting mirror and Φ_n' is an amount of phase necessary for varying a particular radiation pattern, which is defined by

$$\Phi_n' = \tan^{-1}\frac{|\dot{\alpha}|\sin(\phi_n - \phi_3)}{1 + |\dot{\alpha}|\cos(\phi_n - \phi_2)}$$

in which α is a complex constant having a phase term and an amplitude term, the α being determined as $\alpha=(E_1-E)/E_0=-|\alpha|e^{j\phi\alpha}$ so as to make an electric field in a direction (θ, Φ) at a desired value, in the expression α, E being a radiation field in a direction (θ, Φ), E_1 being a desired radiation field in the direction (θ, Φ), E_0 being a radiation field maximum in the (θ, Φ), ϕ_n being a phase of a radiation field $e_n(\theta, \Phi)$ in the direction (θ, Φ) of the n-th part of said divided reflecting mirror and ϕ_a being a phase of said complex constant α.

4,506,271

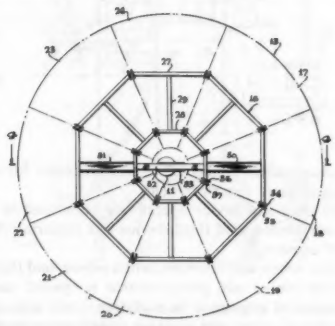
PORTABLE ANTENNA WITH WEDGE-SHAPED REFLECTIVE PANELS

Brian L. Gonzalez, 16033 Arminta St., Van Nuys, Calif. 91406

Filed Sep. 27, 1982, Ser. No. 424,005

Int. Cl.³ H01Q *1/08*

U.S. Cl. 343—915 **1 Claim**



1. A portable antenna assembly comprising the combination of:

a base;

a frame having inner and outer rims joined by braces;

an adjustment means movably coupling one side of said frame to said base;

a plurality of mounting sockets carried on said frame in fixed spaced relationship about said inner and outer rims of said frame opening outwardly from the side of said frame opposite to its side coupled to said base;

a dish-like reflector composed of a plurality of wedge-shaped panels arranged in coaxial relationship with said frame;

each of said wedge-shaped panels having edge marginal regions providing peripheral flanges next to peripheral flanges of adjacent wedge-shaped panels engaging for insertable reception into said mounting sockets to provide a unity construction;

fastener means secure said flanges to said mounting sockets;

each of said mounting sockets comprise a pair of spaced apart flanges having opposing surfaces defining a receptacle for insertably receiving and retaining a pair of adjacent panel flanges;

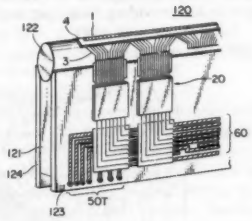
said frame rims constitute a pair of octagon rims coaxially disposed with respect to said reflector and each of said mounting sockets of said plurality disposed at each corner of said octagon inner and outer rims; and

said panels are assembled with said frame from the side of the frame opposite to its side coupled to said base whereby said panels are assembled from one frame side only in an upright position.

4,506,272
THERMAL PRINTING HEAD

Shoji Arai, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 5, 1982, Ser. No. 439,643
Claims priority, application Japan, Nov. 6, 1981, 56-178845
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **6 Claims**



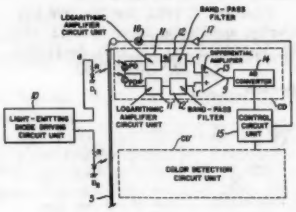
1. A thermal printing head comprising:
(a) a base having opposite sides;
(b) a heating element substrate arranged on one side of said base;
(c) a multilayer wiring substrate arranged on the other side of said base;
(d) a multiple of heaters formed in an array on said heating element substrate, one end of each which is connected to a common electrode;
(e) a plurality of semiconductor devices for driving said multiple of heaters, each of said plurality of semiconductor devices comprising at least a plurality of transistors respectively connected to said multiple of heaters and a shift register having memory cells respectively corresponding to said transistors to process an image signal by serial-parallel conversion so as to allow the image signal to selectively switch said transistors;
(f) a set of multi-layer wiring conductors arranged on said multi-layer wiring substrate and having a terminal mount portion and a multi-layer structure at at least a part thereof, said multi-layer wiring conductors being formed on opposite surfaces of the multi-layer wiring substrate;
(g) a set of straight lead wires supported on an electrically insulating flexible film, one end of each of said straight lead wires being connected to the other end of one of said heaters, and the other end of each of said straight lead wires being connected to one terminal of one of said semiconductor devices; and
(h) a set of L-shaped lead wires supported on another electrically insulating flexible film, one end of each of said L-shaped lead wires being connected to the other end of one of said semiconductor devices, and the other end of each of said L-shaped lead wires being connected to one of said multi-layer wiring conductors.

4,506,273
MULTICOLOR THERMAL TRANSFER RECORDER WITH COLOR DETECTION MEANS

Kazuyuki Komatsu, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,519
Claims priority, application Japan, Jun. 22, 1982, 57-93237
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **1 Claim**

1. In a multicolor thermal transfer recorder for transferring records onto a recording medium by selectively heating an ink film made of a thin base material, on which heat-melting inks of plural colors having a low melting point are coated one after the other consecutively, with a thermal head, wherein a plural-

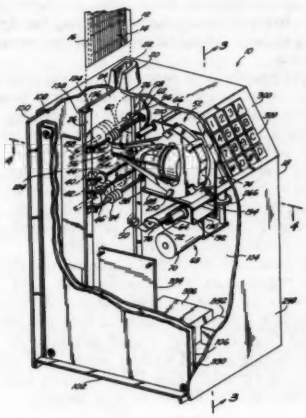


ity of means for detecting the colors of said ink film are disposed at positions separated from each other.

4,506,274
TIME CARD RECORDER AND METHOD FOR IDENTIFYING EMPLOYEE WORK SCHEDULE

Ronald J. Coe, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Continuation of Ser. No. 422,854, Sep. 24, 1982, abandoned, which is a continuation of Ser. No. 189,967, Sep. 23, 1980, abandoned. This application Nov. 3, 1983, Ser. No. 549,007
Int. Cl.³ G07C *1/14*
U.S. Cl. 346—82 **5 Claims**



1. A time card recorder for recording clocking times for each of a plurality of employees upon a corresponding time card, and for indicating which among a plurality of different operations of said recorder is permissible at an employee's actual clocking time according to one time schedule from among a plurality of time schedules, said time card bearing data identifying one of said schedules, reading means for reading said data from said time card, said data being the same for a plurality of said time cards associated with said one time schedule, and means connected with said reading means for indicating the impermissibility of the operation of said recorder in response to an attempt by said employee to operate said recorder in an impermissible way, and indicating which of said plurality of operations is permissible.

4,506,275

IMAGE SCANNING AND RECORDING DEVICE

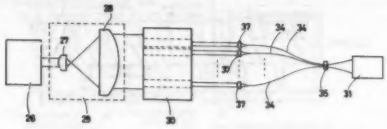
Kiyoshi Maeda, Takatsuki, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Jul. 6, 1982, Ser. No. 395,436

Claims priority, application Japan, Jul. 13, 1981, 56-109830; Jul. 17, 1981, 56-112825; Jul. 18, 1981, 56-112563

Int. Cl.³ G01D *9/42*

U.S. Cl. 346—108 5 Claims



1. An image scanning and recording device including a recording unit for duplicating and recording halftone images on a photosensitive material, said recording unit comprising:

light source means for providing a beam of light;

acousto-optic light modulating means for modulating light from said light source means, said acousto-optic light modulating means comprising a plurality of ultrasonic wave exciting portions disposed side by side in an array on a single acousto-optic medium, and said ultrasonic wave exciting portions each adapted for independently modulating incident light into respective modulated light beams in response to image signals from a photoelectrical scanning means of said device;

directing means for directing light from said source to said acousto-optic light modulating means, said directing means comprising a light flattener which comprises a pair of cylindrical lenses so arranged to have a common focal axis and a common focal point for flattening the light beam from the source and distributing the flattened beam along the array of the plurality of ultrasonic wave exciting portions;

light spot row forming means for forming rows of tiny light spots produced by said modulated light beams on a recording material, said light spot row forming means comprising a focussing lens system for receiving the modulated light beams from the acousto-optic modulating means and for causing the recording material to be exposed to the rows of tiny light spots, whereby the rows of tiny light spots are formed by projecting the plurality of modulated light beams in a predetermined scale down ratio onto the recording material; and

transfer means for individually transferring the modulated light beams from the acousto-optic light modulating means to the focussing lens system, said transfer means comprising a plurality of optical fiber bundles with each optical fiber including a clad covering the respective fibers making up said transfer means, and said fibers arranged in a configuration for preventing said clads from extending the distribution of light quantity.

4,506,276

INK SUPPLY SYSTEM

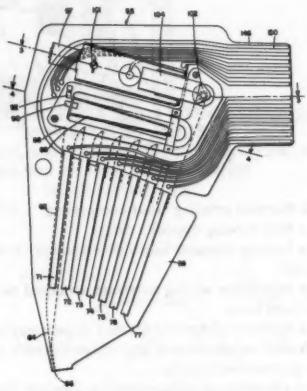
Edmond L. Kyser, Portola Valley; Charles S. Mitchell, Palo Alto, and Stephan B. Sears, Portola Valley, all of Calif., assignors to System Industries, Inc., Milpitas, Calif.

Division of Ser. No. 807,219, Jun. 16, 1977, Pat. No. 4,183,031, and Ser. No. 489,985, Jul. 19, 1974, Pat. No. 4,189,734, said Ser. No. 807,219, is a division of Ser. No. 694,064, Jun. 7, 1976, Pat. No. 4,074,284. This application Oct. 23, 1978, Ser. No. 953,698

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R 16 Claims

1. An improved ink jet printer of the type having an ink supply, a asynchronous, volume displacement droplet ejection print head in fluid communication with the ink supply, the print head having at least one droplet ejecting nozzle and carriage means for effective relative movement between the print head and a print receiving medium, wherein the improvement comprises a supply of pressurized degassed, liquid ink, a sealed collapsible container for said ink, the container maintaining the ink in its gas-free state during storage, interchange of containers, and utilization in the ink jet printer, a receptable for the collapsible container, the receptacle removably receiving the container, a supply line for providing fluid communication between the receptacle and the print head, means within the receptacle for providing fluid communication between the



interior of the collapsible container and the ink supply line by penetrating the container seal when it is inserted into the receptacle, the print head including valving means for controlling the flow of ink from the supply line into the print head, means for sensing the pressure of the ink within the print head and wherein the valving means separates the pressure sensing means from the pressure of the ink supply within the collapsible container, and further including control means connected to the pressure sensing means to control the opening and closing of the valving means.

4,506,277

NOZZLE-RESTORING SUCTION DEVICE FOR INK JET PRINTER

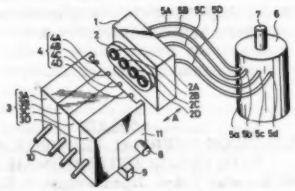
Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1983, Ser. No. 490,160

Claims priority, application Japan, May 11, 1982, 57-79403

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R 6 Claims



1. A nozzle-restoring suction device comprising:

suction means for generating a negative pressure;

capping means comprising independent closing caps corresponding to respective colors of emitting ink respectively provided for plural nozzles of a recording head which emits inks of plural colors for tightly closing the nozzles; and

connection means for connecting said suction means with said capping means for enabling suction from the front ends of the nozzles by the negative pressure of said suction means.

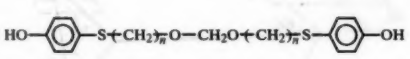
4,506,278

THERMOSENSITIVE RECORDING MATERIAL

Hiroshi Sakamoto; Norihiko Inaba, both of Numazu, and Keishi Taniguchi, Shizuoka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

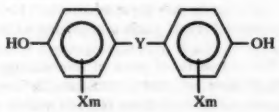
Filed Mar. 2, 1984, Ser. No. 585,792
Claims priority, application Japan, Mar. 10, 1983, 58-39498
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—216 **6 Claims**

1. In a thermosensitive recording material comprising a support material and a thermosensitive coloring layer formed on said support material, said thermosensitive coloring layer comprising a colorless or light-colored coloring material and a color developing material capable of coloring said coloring material upon application of heat thereto, the improvement wherein said color developing material comprises at least one first bisphenol derivative of the formula (I) and at least one second bisphenol derivative of the formula (II),



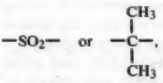
(I)

wherein n is an integer of 1 or 2,



(II)

wherein X represents halogen, Y represents



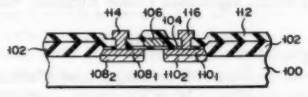
m is an integer of 1 or 2, and the substitution positions of Xm in the benzene rings are symmetrical with respect to Y.

4,506,279

METAL-OXIDE-SEMICONDUCTOR DEVICE WITH BILAYERED SOURCE AND DRAIN

Yoshihisa Mizutani, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 13, 1983, Ser. No. 531,618
Claims priority, application Japan, Sep. 17, 1982, 57-161652
Int. Cl.³ H01L *29/78*
U.S. Cl. 357—23.11 **4 Claims**



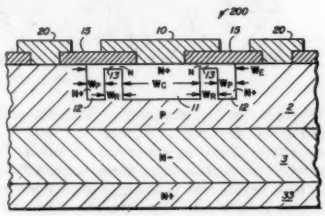
1. A metal-oxide-semiconductor device comprising:
a semiconductor substrate;
a source region formed in the surface region of the semiconductor substrate;
a drain region of two-layer design formed in the surface region of the semiconductor substrate, including an upper layer and a lower layer having a higher impurity concentration than that of the upper layer; and
a gate electrode formed on an insulation layer on the channel region between the source and drain regions.

4,506,280

TRANSISTOR WITH IMPROVED POWER DISSIPATION CAPABILITY

Perry L. Merrill; Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 377,237, May 12, 1982, abandoned, which is a continuation of Ser. No. 209,074, Nov. 21, 1980, , which is a continuation of Ser. No. 33,282, Apr. 25, 1979, abandoned. This application Feb. 2, 1984, Ser. No. 576,764
Int. Cl.³ H01L *29/72, 27/02, 29/06*
U.S. Cl. 357—36 **1 Claim**



1. A semiconductor device comprising:
a base region of a first conductivity type and a first conductivity;
an emitter region of a second conductivity type and a second conductivity, formed in said base region and extending to a first surface of said semiconductor device, and divided by said base region into an active central portion and an active peripheral portion flanking said central portion, wherein said central and peripheral portions have the same first depth into said base region, wherein said emitter is substantially stripe-shaped, wherein said central portion comprises a central stripe, wherein said peripheral portion comprises first and second peripheral stripes lying on either side of said central stripe, wherein said central portion has a transverse width substantially equal to the transverse width of said peripheral portion, and wherein said central portion has sufficient area relative to said peripheral portion that a substantial part of the emitter current flows into said base region directly from said central portion of said emitter;
a resistor region of the same conductivity type as said emitter region, formed in said base region and extending to said first surface and of a second depth into said base region less than said first depth, and bridging between said central portion and said peripheral portion; and
an emitter electrode in contact with said emitter region only in said central portion.

4,506,281

GAAS SEMICONDUCTOR DEVICE

Jun-ichi Nishizawa, and Tadahiro Ohmi, both of Komegafukuro Sendai, Japan, assignors to Semiconductor Research Foundation, Japan

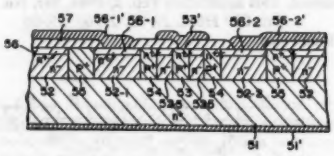
Continuation of Ser. No. 35,460, May 3, 1979, Pat. No. 4,320,410. This application Aug. 24, 1981, Ser. No. 295,816
Claims priority, application Japan, May 8, 1978, 53-54270
Int. Cl.³ H01J *27/02*
U.S. Cl. 357—43 **5 Claims**

1. A GaAs semiconductor device, comprising:
an n type GaAs layer of low resistivity;
an n type intermediate GaAs layer of high resistivity overlying said n type layer;

an n type GaAs surface layer of low resistivity overlying said n type intermediate layer;

a first p type GaAs region of low resistivity having a through hole path therein, extending from the surface of said n type surface layer at least into said n type intermediate layer, surrounding a first portion of each of said n type surface layer and said n type intermediate layer and defining a continuous n type current path between said n type layer and said first portion of the n type surface layer;

the first portion of said n type intermediate layer having such dimensions that the built-in voltage of the pn junction with the first p type region established a depletion layer therein to produce a potential barrier for electrons in said



continuous n type current path without any external bias applied to said first p type region;

a second p type GaAs region of low resistivity located in said n type intermediate layer in the neighborhood of said first p type region and sandwiching a second portion of said n type intermediate layer therebetween;

the n type layer, the first portions of the n type intermediate layer and the n type surface layer and the first p type region constituting a source, a channel, a drain and a gate of an n channel static induction transistor;

the second p type region, the second portion of the n type intermediate layer of the first p type region constituting an emitter, a base and a collector of a pnp bipolar transistor.

4,506,282

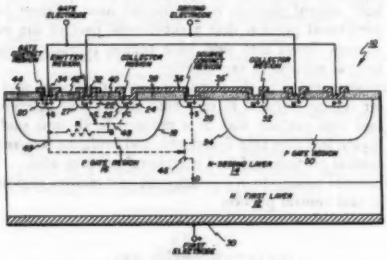
NORMALLY-OFF SEMICONDUCTOR DEVICE WITH LOW ON RESISTANCE AND CIRCUIT ANALOGUE

Bantval J. Baliga, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,174

Int. Cl.³ H01L *29/72, 29/80*

U.S. Cl. 357—43 **11 Claims**



1. A normally-off semiconductor device with low on-resistance comprising:

a first layer highly-doped to one conductivity type;

a first main current electrode adjoining the underside of said first layer;

a second layer of the one conductivity type disposed atop said first layer;

a gate region adjoining an upper portion of said second layer and being of a conductivity type opposite to that of said second layer;

a highly-doped gate contact region of the opposite conductivity type adjoining said gate region;

a gate electrode adjoining said gate contact region;

emitter and collector regions adjoining said gate region and being of the one conductivity type, said emitter and said collector regions being separated from said second layer by said gate region;

a second main current electrode adjoining said emitter region; and

interconnection means ohmically connecting said collector region to said second layer, said interconnection means including a highly-doped source contact region of the one conductivity type adjoining said second layer.

4,506,283

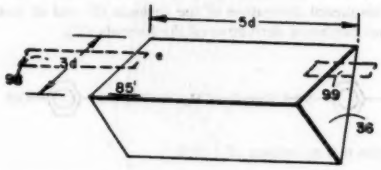
SMALL AREA HIGH VALUE RESISTOR WITH GREATLY REDUCED PARASITIC CAPACITANCE

Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 8, 1981, Ser. No. 261,435

Int. Cl.³ H01L *27/04*

U.S. Cl. 357—51 **4 Claims**



1. An array of sub-micron dimensioned resistors formed in a silicon substrate doped P-type, each comprising in combination:

a plurality of first sidewalls of pairs of intersecting slots in spaced apart relation across the substrate defining semi-arrays of V shaped intermediate regions which will become resistors;

silicon oxide filling said slots and covering the surface of the substrate through which they were made;

a plurality of second sidewalls of orthogonal slots relative to said pairs of slots dividing the semi-arrays of regions into individual resistor active regions;

N+ doping introduced into each of said active regions via said second sidewalls and driven in to change resistive values of said regions from the resistive value of the substrate;

metallization patterns in electrical connection with the doped active regions; and,

silicon oxide at least substantially covering the periphery of each active region.

4,506,284

ELECTRON SOURCES AND EQUIPMENT HAVING ELECTRON SOURCES

John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,143

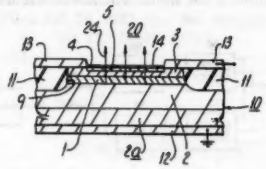
Claims priority, application United Kingdom, Nov. 6, 1981, 8133502

Int. Cl.³ H01L *29/34*

U.S. Cl. 357—52 **9 Claims**

1. An electron source for emitting a flow of electrons, comprising a semiconductor body having an n-type first region which is separated from a second region of the body by a barrier including a p-n junction located between the first and second regions, and electrode connections to said first and second regions for applying a potential difference across the barrier so as to bias the first region positive with respect to the second region and thereby to establish a supply of hot electrons which are injected from the second region across the barrier into the first region and which are emitted from a

surface area of the body, characterized in that the body further comprises a surface region which adjoins the surface area from which the hot electrons are emitted and which comprises a p-type doping concentration serving to form between the



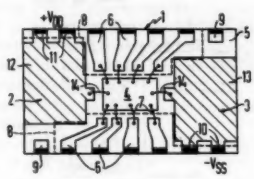
n-type first region and said surface area a potential peak which is spaced from said surface area to provide adjacent said surface area a drift field which accelerates electrons towards said surface area.

4,506,285

SUBSTRATE MADE OF VARISTOR MATERIAL HAVING A PLURALITY OF ELECTRONIC COMPONENTS MOUNTED THEREON

Richard Einzinger, Ruhpolding, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 516,676
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3231118
Int. Cl.³ H01L *27/02, 39/02, 23/48*
U.S. Cl. 357—80 **7 Claims**



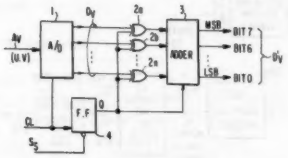
1. A combined circuit arrangement, comprising:
a plurality of electronic components;
a substrate body on which the electronic components are commonly integrated;
at least one of said components on the substrate body being electrically conductively connected to at least one further component which is formed in a sub-region of the substrate body;
the substrate body comprising zinc oxide ceramic with a dopant rendering the ceramic electrically insulating;
the sub-region of the substrate body being designed as ceramic having a decreasing resistance vs. increasing applied voltage varistor property and is provided with two electrodes which are disposed on at least one surface of the sub-region so as to form said one further component; and
other regions of the zinc oxide ceramic substrate body being provided substantially electrically insulating and having a high resistance relative to a resistance of the sub-region.

4,506,286

PAL DIGITAL VIDEO SIGNAL PROCESSING ARRANGEMENT

Kazuo Kashigi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,897
Claims priority, application Japan, Oct. 27, 1981, 56-171688
Int. Cl.³ H04N *9/32*
U.S. Cl. 358—13 **7 Claims**



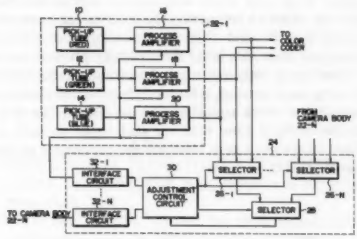
2. A PAL video signal processing arrangement comprising:
converter means for converting a color subcarrier into a color subcarrier, said digital signal being sampled at sampling points associated with ±U and ±V axes on a color vector plane and said digital signal consisting of a plurality of parallel bits;
means for generating a timing signal associated with ±V axis;
a plurality of exclusive OR gates each for receiving said timing signal and a respective one of said parallel bits; and
means for adding the timing signal to the least significant bit of the outputs of said plurality of exclusive OR gates.

4,506,287

COLOR TELEVISION CAMERA APPARATUS

Junichi Yamanaka, Sagamihara, and Taizou Nishino, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 26, 1982, Ser. No. 401,709
Claims priority, application Japan, Jul. 29, 1981, 56-118735
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—21 R **6 Claims**

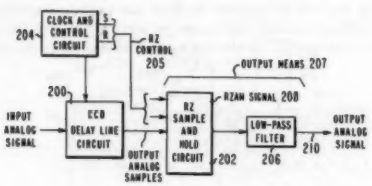


1. A color television camera apparatus, comprising:
image pick-up means for producing primary-color analog video output signals according to incident light from an object;
means for converting said output signals from said image-pick-up means into digital output signals;
process amplifier means for digitally adjusting the digital output signals from said converting means; and
adjustment control means for supplying digital adjustment data to said process amplifier means in accordance with digital output signals from said process amplifier means, said adjustment data being applied to said process amplifiers to adjust said output signals from said converting means.

4,506,288
CCD DELAY LINE SYSTEM FOR TRANSLATING AN ANALOG SIGNAL

Henry G. Lewis, Jr., Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 5, 1982, Ser. No. 439,561
Int. Cl.[3] H04N 9/535
U.S. Cl. 358—21 R 4 Claims



1. In an analog signal translation system comprising (1) a charge coupled device (CCD) delay line circuit having an input, an output and coupling means including a CCD delay line coupling said input to said output, (2) a clock and control circuit applying clock signals at a given clock frequency to said CCD delay line circuit for sampling an input analog signal applied to said input of said CCD delay line circuit at said given clock frequency and for transferring said sampled analog signal at said given clock frequency along said CCD delay line of said coupling means to said output of said CCD delay line circuit, whereby output analog signal samples occurring at said given clock frequency are derived at said output of said CCD delay line circuit, and (3) output means including a low-pass filter having a cut-off frequency below said given clock frequency, said output means being coupled to said output of said CCD delay line circuit and being responsive to said output analog signal samples for deriving, at an output of said low-pass filter, an output analog signal from which said given clock frequency has been removed; the improvement wherein:

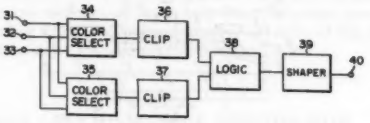
said output means includes a return-to-zero (RZ) sample and hold circuit coupled between said output of said CCD delay line circuit and an input to said low-pass filter, said sample and hold circuit being controlled by a control signal from said clock and control circuit for sensing at said given clock frequency the level of each output analog signal sample and then maintaining said input to said low-pass filter at a level substantially proportional to said sensed level only for a predetermined time interval following each sensing, which predetermined time interval is less than a clock signal period, so that at the end of said predetermined time interval said input to said low-pass filter returns to a zero level for the remainder of that clock signal period.

4,506,289
CHROMA-KEY SIGNAL GENERATOR

Toshiaki Shirakami, Kawasaki, Japan, assignor to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1982, Ser. No. 435,293
Claims priority, application Japan, Oct. 20, 1981, 56-168264
Int. Cl.[3] A04N 9/535
U.S. Cl. 358—22 7 Claims

1. A chroma-key signal generator comprising: a first color selection circuit for receiving three primary color signals as inputs and operative to select as an output any desired hue signal, a first clip circuit for clipping the hue signal from the first color selection circuit at a given level to produce a first key signal, a second color selection circuit for receiving the aforesaid three primary color signals as inputs and operative to select as an output a hue signal which is different from the hue

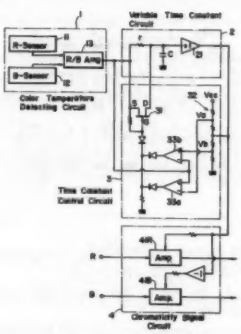


signal from the first color selection circuit, a second clip circuit for clipping the hue signal from the second color selection circuit at a given level to produce a second key signal, and a logical and arithmetic circuit for receiving the first and the second key signals and performing a logical and arithmetic operation thereon to produce a third key signal.

4,506,290
WHITE BALANCING APPARATUS FOR COLOR TELEVISION CAMERAS

Takaaki Hashimoto, Noda, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 421,910
Claims priority, application Japan, Oct. 1, 1981, 56-154751
Int. Cl.[3] H04N 9/04
U.S. Cl. 358—29 5 Claims



1. In a white balancing apparatus for automatically adjusting the gain of chromaticity signal circuits of a color television camera in accordance with an output of a color temperature detecting circuit for detecting the color temperature of light illuminating an object to be shot by the camera, the combination comprising:

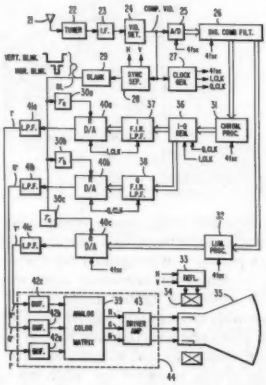
at least one variable time constant circuit for providing an output of said color temperature detecting circuit with a desired time constant; and

at least one time constant control circuit for varying the time constant of said variable time constant circuit in accordance with the value of an output of said color temperature detecting circuit.

4,506,291
TELEVISION RECEIVER WITH DIGITAL SIGNAL PROCESSING HAVING A DIGITAL-TO-ANALOG CONVERTER CONTROL CAPABILITY

Henry G. Lewis, Jr., Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 29, 1982, Ser. No. 402,836
Int. Cl.[3] H04N 9/535
U.S. Cl. 358—33 10 Claims



1. In a television display system wherein drive signals containing luminance and chrominance representative information, derived from a plurality of analog output signals are applied to various ones of the electrodes of a color picture tube for producing a picture display, a digital signal processing system for developing said analog output signals and for placing selective ones of said analog output signals in predetermined states, comprising;

means for developing an input signal containing color picture information;

means for developing a plurality of signal bit groups representative of said input signal;

a luminance processor responsive to said plurality of signal bit groups for developing a plurality of signal bit groups representative of the luminance information contained in said color picture information;

a chrominance processor responsive to the first mentioned plurality of signal bit groups for developing a plurality of signal bit groups representative of the chrominance information contained in said color picture information;

a digital-to-analog converter arrangement responsive to the signal bit groups developed by said luminance and chrominance processors for developing a plurality of analog output signals representative of said luminance and chrominance information;

a driver stage of said display system receiving said plurality of analog output signals for developing said drive signals to produce a display that contains said color picture information;

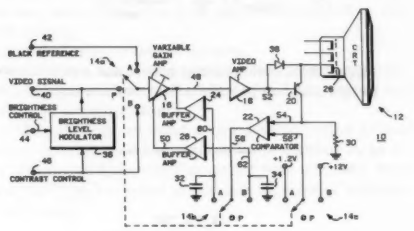
means for developing a control signal; and

means coupled to said digital-to-analog converter arrangement and responsive to said control signal for placing selected ones of said analog output signals in predetermined states.

4,506,292
VIDEO DRIVER CIRCUIT AND METHOD FOR AUTOMATIC GRAY SCALE ADJUSTMENT AND ELIMINATION OF CONTRAST TRACKING ERRORS

Anthony D. Newton, Geneva, Switzerland, and Geoffrey W. Perkins, Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 388,281, Jun. 14, 1982, abandoned. This application Oct. 3, 1984, Ser. No. 657,467
Int. Cl.[3] H04N 5/14, 5/16, 5/197, 9/535
U.S. Cl. 358—34 34 Claims



1. A driver circuit for applying a video input signal to a video display comprising

a gain controlled amplifier having gain input and output terminals and a variable gain terminal thereof, said gain input terminal for receiving said video input signal,

a video amplifier having video input and output terminals thereof, said video input terminal being connected to said gain output terminal of said gain controlled amplifier, and said video output terminal being coupled to said video display,

first feedback means sampling a signal level at said video display for establishing a dc operating point at said video input terminal of said video amplifier indicative of an inserted dc setup reference level of said video display,

second feedback means sampling a signal level at said video display for establishing a gain control voltage level at said variable gain terminal of said gain controlled amplifier indicative of an inserted gain reference level of said video display, and

contrast control means for applying a variable input gain setup reference signal to said gain input terminal of said gain controlled amplifier whereby said second feedback means compensates for changes in amplitude of said variable input gain setup reference signal.

4,506,293
INDEPENDENT FLESHTONE CONTOURS

Robert N. Hurst, Jr., Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 284,105, Jul. 16, 1981, abandoned. This application Jun. 28, 1984, Ser. No. 625,194
Int. Cl.[3] H04N 9/535
U.S. Cl. 358—37 14 Claims

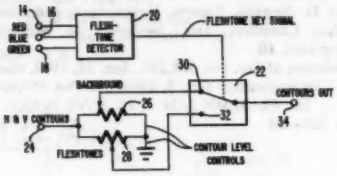
1. An apparatus for processing a color video signal, said apparatus comprising:

generating means for generating a contour signal from said video signal,

detecting means for detecting the hue represented by said video signal; and

combining means comprising a fleshtone detector and a contour control circuit coupled to said detecting means and generating means for combining a selected amount of said contour signal with said video signal in accordance with a control signal represented by the hue of said video signal, said fleshtone detector comprising an amplifier coupled to receive a Q signal from said detecting means, a negative absolute-value circuit coupled to said amplifier,

an adder having a first input coupled to said negative absolute-value circuit and a second input for receiving an



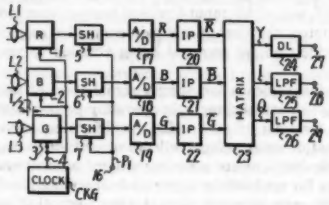
I signal from said detecting means, and a rectifier coupled to said adder to provide a fleshtone key signal.

4,506,294

SOLID STATE CAMERA

Fumio Nagumo, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,052
Claims priority, application Japan, Feb. 10, 1982, 57-19975
Int. Cl.³ H04N 9/09
U.S. Cl. 358—50 **9 Claims**



1. A solid state camera comprising:

(A) a plurality of image sensors, each having a plurality of picture sensing units spaced apart by an alignment pitch;

(B) means for projecting an image simultaneously on each of said image sensors;

(C) means for displacing the image on each sensor by a predetermined distance in a given direction with respect to at least one other of said sensors;

(D) reading means coupled to said picture sensing units for reading said respective images sequentially in said given direction and for generating video signals representing said respective images;

(E) means for sampling each of said video signals by a sampling signal and for generating sampled signals;

(F) means for converting said sampled signals to digital signals,

(G) means for interpolating a signal generated from the digital signal during adjacent two samples between said adjacent two samples in each video signal and for generating interpolated outputs so that the group delay characteristics of said outputs are substantially equivalent, and

(H) means for synthesizing said interpolated outputs and for generating a desired signal.

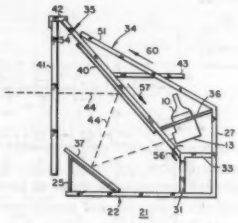
2. A solid state camera according to claim 1, wherein said reading means includes a clock generator for generating a reading clock with the frequency of 2 fsc wherein fsc is the frequency of color subcarrier.

4,506,295

PROJECTION TELEVISION RECEIVER WITH UNITARY OPTICS FRAME

James R. Young, and Bertram VanBreemen, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 30, 1982, Ser. No. 403,457
Int. Cl.³ H04N 9/31
U.S. Cl. 358—60 **9 Claims**



1. A projection television system, comprising:

a skeletal frame, incorporating a plurality of rigid members forming a plurality of integrated sub-frames;

a plurality of projection television tubes mounted on said frame, for producing lighted images;

a mirror assembly mounted on said frame, for receiving light from said tubes and directing said light at a predetermined angle with respect to said mirror assembly; and

a projection screen, mounted for receiving light from said mirror assembly such that a viewable image is formed on the front of said screen,

whereby the relative position of said projection tubes, said mirror assembly and said screen are fixed by said frame,

wherein said mirror assembly comprises first and second mirrors, said first mirror receiving light from said projection tubes and said second mirror receiving light from said first mirror and directing said light to said screen, said second mirror being located between said screen and said projection tubes.

4,506,296

METHOD AND DEVICE FOR THREE-DIMENSIONAL VISUALIZATION FROM VIDEO SIGNALS, NOTABLY FOR ELECTRON MICROSCOPY

Alain R. P. Marraud, Villebon S. Yvette, and Maurice G. Q. Bonnet, Puteaux, both of France, assignors to Centre National de la Recherche Scientifique, France

Filed Jan. 13, 1982, Ser. No. 339,174
Claims priority, application France, Jan. 16, 1981, 81 00758
Int. Cl.³ H04N 9/54
U.S. Cl. 358—88 **17 Claims**

1. A method of three dimensional visualization of an object, including the following steps:

(a) producing a number (n) of sets of video signals (Sk; k varying from 1 to n) respectively corresponding to a number (n) of base images (Vk) of the object taken with the same field, but at different photographing angles (Ak) corresponding to relative turning of the object around a common axis passing through the object and perpendicular to the optical axis of observation;

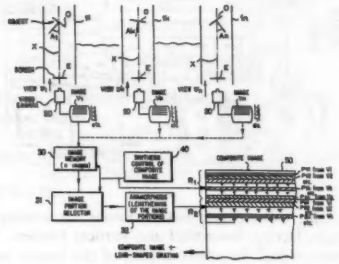
(b) registering said sets of video signals (Sk),

(c) dividing each of the base images (Vk) of the object in a plurality of adjacent elementary portions (P) corresponding to adjacent bands parallel to a common general direction,

(d) selecting in each set of video signals the video signals corresponding to, respectively, said portions,

(e) forming a composite image divided into a plurality of adjacent regions, said adjacent regions having the same configuration as that of said portions and said composite

image having a number of adjacent regions which equals the number of said portions of each base image so that the portions of each base image are respectively associated with the regions of the composite image, each of said regions being composed of a number (n) of associated portions respectively defined from the selected video signals of each set of video signals, by arranging for each region of the composite image the selected video signals corresponding to the associated portions in an order corresponding to the respective photographing angles (ak),



said step of forming a composite image being operated simultaneously with the step of

(f) changing the magnification of said adjacent elementary portions between the general direction of said adjacent elementary portions (P) and the direction which is perpendicular thereto, in a ratio equal to said number (n)

(g) positioning in optical cooperation with the composite image thus formed a lenticular grating comprising elementary lenses, in which the grid of the lenticular grating reproduces and corresponds to the shape of said regions.

4,506,297

INTEGRATED CIRCUIT FOR TELEVISION RECEIVERS COMPRISING A SONIC SEPARATOR WITH A CLAMPING CIRCUIT

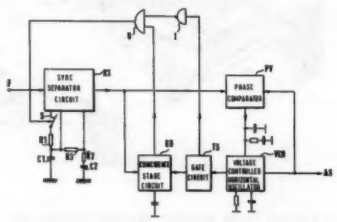
Herbert Elmis, Denzlingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 24, 1982, Ser. No. 391,623

Claims priority, application European Pat. Off., Jul. 11, 1981, 81 105411.3

Int. Cl.³ H04N *5/08, 5/10, 7/00*

U.S. Cl. 358—153 **3 Claims**



1. In a circuit for a television receiver having:

a sync separator with a clamping circuit, said clamping circuit having first and second resistor-capacitor sections, the first resistor-capacitor section having a first resistor with first and second leads and a first capacitor with first and second leads, the second resistor-capacitor section having a second resistor with first and second leads and a second capacitor with first and second leads and a third resistor with first and second leads, said first leads of said capacitors being grounded, with said second lead of said first capacitor coupled to said first lead of said first resistor, said second lead of said second capacitor coupled to said first lead of said second resistor, said first lead of said third resistor coupled to said first lead of said first resistor and to said sync separator, said second lead of said third resistor coupled to said second lead of said second resistor and said sync separator,

a coincidence circuit coupled to an output of said sync separator, for selectively providing first and second signal levels at an output thereof,

a gate circuit for providing output pulses of a selected duration coupled to an input to said coincidence circuit,

a voltage controlled horizontal oscillator coupled to said gate circuit,

wherein the improvement comprises:

an electronic switch with a control input said switch coupled between said second terminal of said first resistor and said sync separator; and

an AND gate with an input coupled to an output of said coincidence stage circuit and an input coupled to an inverted output from said gate circuit with an output from said AND gate coupled to said control input of said electronic switch.

4,506,298

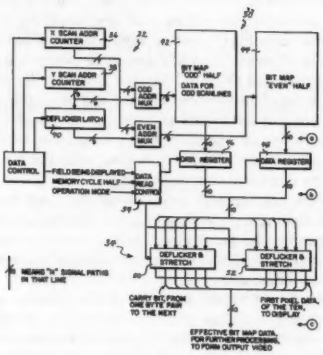
METHOD AND APPARATUS FOR DISPLAYING OBJECTS ON AN INTERLACED RASTER SCAN TELEVISION SCREEN

Barry N. Mansell, Billerica, and David Friedman, Bedford, both of Mass., assignors to Computervision Corporation, Bedford, Mass.

Filed Nov. 9, 1982, Ser. No. 440,301

Int. Cl.³ H04N *5/14*

U.S. Cl. 358—160 **11 Claims**



1. A method for displaying objects on an interlaced, raster scan television screen where there is initially at least one data point for each pixel, said method comprising the steps of:

(1) displaying a data point as a pixel on the screen; and,

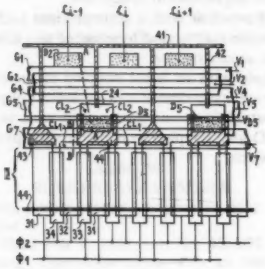
(2) displaying the same data point at pixel locations displaced by at least one unit in each of two axes, the direction of displacement in each axis being the same for all data points.

4,506,299

DEVICE FOR SCANNING AN IMAGE IN SUCCESSIVE LINES, UTILIZING THE ELECTRICAL CHARGE TRANSFER, INCORPORATING A LINE MEMORY AND A TELEVISION CAMERA INCORPORATING SUCH A DEVICE

Jean-Luc Berger, and Patrick Descure, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 13, 1982, Ser. No. 368,005
Claims priority, application France, Apr. 16, 1981, 81 07672
Int. Cl.³ H04N 3/14
U.S. Cl. 358—213 19 Claims



1. An area image sensory device comprising:

(a) a semiconductor substrate,

(b) a plurality of elementary photosensitive areas formed on said substrate and separated from one another and formed in a matrix of N lines and M columns, and in said areas electrical charge signals are produced proportional to received illumination of an image;

(c) a charge transfer device formed on said substrate having line memory means with M areas for receiving in parallel the electrical charge signals from M photosensitive areas which are all in a same line and periodically supplying said charge signals to an output; said line memory means having

(i) first grid means (G_1) adapted to be connected to a constant potential (V_1) and located between the matrix and said areas of the memory for insuring decoupling between said areas of the matrix and the charge transfer device,

(ii) at least one charge storage grid adapted to be connected to a periodic amplitude alternating potential for maintaining the electrical charge signals,

(iii) supplementary grid means adjacent to said storage grid for receiving a periodic amplitude alternating potential,

(iv) parasitic charge removal means having a plurality of removal diodes for draining parasitic charges from each of said columns, and

(v) control grid means for receiving a periodic amplitude alternating potential and for controlling access to said removal diodes, a training charge (Qo) being maintained beneath said storage grid during said parasitic charge drawing and during receiving said electrical charge signals only by a potential barrier beneath said supplementary grid means being caused by said periodic potential received by said grid means reaching a predetermined amplitude; and

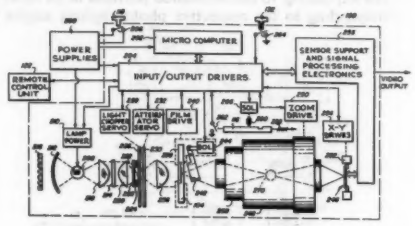
(d) analog shift register means for receiving in parallel said charge signals supplied by said line memory and for supplying in series an output picture scanning signal.

4,506,300

FILM VIDEO PLAYER WITH ZOOM, SCAN, AND AUTOMATIC BORDER CONTROL

William T. Fearnside, Fishers, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,077
Int. Cl.³ G02B 7/11
U.S. Cl. 358—225 8 Claims



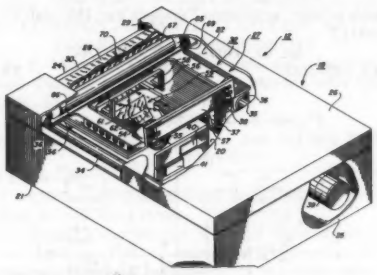
1. In a film video player having means for sensing a film frame image, having horizontal and vertical borders, to produce a video signal for video display of the image, said film video player having means for changing the magnification of the film image with respect to the video display and means for translating the film image horizontally and vertically with respect to the video display, the improvement comprising: control means for coordinating the horizontal and vertical translation of the film image with the magnification of said image such that the video display remains filled with said film image.

4,506,301

MULTIPLE MODE RASTER SCANNER

William Kingsley; James C. Stoffel, both of Rochester; John F. Moreland, Jr., Fairport; Ronald G. Matteson, Walworth; Douglas G. Wiggins, Penfield, and Robert F. Allis, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 12, 1979, Ser. No. 84,209
Int. Cl.³ H04N 1/40
U.S. Cl. 358—280 12 Claims



1. In a raster input scanner, the combination of:

(a) multiple speed scanning means for scanning originals to provide image signals representative of the image on said originals, said scanning means being selectively operable at a first scanning rate for predominantly line images and at a second scanning rate for other images;

(b) first image processing means for procesing image signals produced by said scanning means at said first scanning rate to provide a binary level image signal output;

(c) second and third image processing means for processing image signals produced by said scanning means at said second scanning rate;

said second image processing means being adapted for use when said other images comprise predominantly continuous tone images, said second image processing means providing a binary level image signal output;

said third image processing means being adapted for use when said other images comprise halftone and/or continuous tone images, said third image processing means providing a digital signal output representing the gray scale level of the image signals processed; and

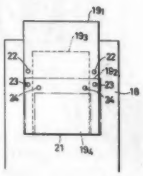
(d) selector means for selecting one of said scanning means first and second scanning rates, and one of said second and third image processing means when said second scanning rate is selected.

4,506,302

CUT SHEET FACSIMILE

Masami Kurata, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1982, Ser. No. 446,747
Claims priority, application Japan, Dec. 4, 1981, 56-194440
Int. Cl.³ H04N *1/04, 1/10, 1/02*
U.S. Cl. 358—285 **7 Claims**



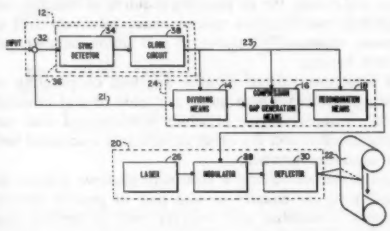
1. A facsimile apparatus, comprising: a receiving side, a plurality of sheet supplying units at said receiving side for supplying recording sheets comprising at least two kinds of cut sheets of different sizes, respectively, a transmitting side, discriminating means at said transmitting side for sensing and logically discriminating the size of an image to be transmitted; and cut sheet supplying unit selecting means for selecting one of said cut sheet supplying units according to a discrimination result of said discriminating means, so that image data are recorded on a selected one of said recording sheets.

4,506,303

OPTICAL DATA RECORDER SYSTEM

William J. Hannan, Concord, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Sep. 24, 1982, Ser. No. 423,482
Int. Cl.³ H04N *3/14, 1/22*
U.S. Cl. 358—302 **34 Claims**



1. An optical data recording system comprising:

reception means for receiving an input data stream to be recorded on a recording medium;

means responsive to said reception means for dividing said input data stream into a series of data sections;

means for compressing each said data section in said series into a period shorter than the period of the original section and for providing data gaps between each compressed data section;

means for recombining said compressed data sections including said data gaps into a gapped output data stream; and

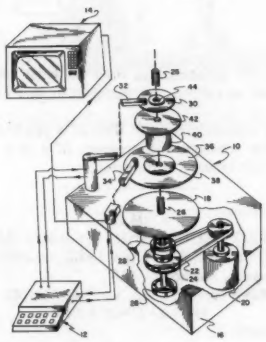
means for recording said gapped output data stream on a recording medium.

4,506,304

APPARATUS FOR TRANSFERRING PRE-RECORDED IMAGE SIGNAL INFORMATION FROM ONE RECORDING MEDIUM TO A MASTER RECORDING MEDIUM

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 3, 1982, Ser. No. 374,537
Int. Cl.³ G11B *27/02, 5/86*
U.S. Cl. 360—14.3 **4 Claims**



1. Video disc apparatus adapted for use with a recordable, multitrack master storage video disc and a prerecorded multitrack transfer storage video disc, said apparatus comprising:

shaft means for commonly mounting and rotating said transfer storage video disc and said master storage video disc in synchronism;

a playback head for reading the signals recorded on said transfer storage video disc;

means coupled to said playback head for electronically editing the video signals received from said playback head; and

a record head coupled to said electronic editing means for recording the edited video signals onto said master storage video disc.

4,506,305

METHOD FOR DETECTING A FAULT IN A DATA RECORDING SYSTEM READ CHANNEL

Silvio A. Cardero, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1982, Ser. No. 433,186
Int. Cl.³ G11B *5/09, 27/36, 5/02*
U.S. Cl. 360—46 **7 Claims**

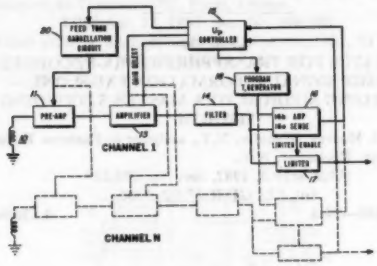
1. In a data recording system including a READ channel having a preamplifier connected to receive a recorded data signal from a magnetic read head, a gain controlled amplifier, connected to said preamplifier, an equalizing filter connected to said gain controlled amplifier, an amplitude level sense circuit which provides an output binary 1 level when a signal level in said channel is above a programmable threshold signal for a first minimum time interval, and when said signal level subsequently declines below said threshold level for a second minimum time interval, and a limiter connected to said filter, a

method for determining a fault in said READ channel comprising:

reducing said threshold signal to a fraction of a nominal level;

isolating said read head from said preamplifier;

applying a plurality of input data pulses to said preamplifier;



measuring the difference in time between said input data pulses and an output indication from said limiter circuit; and

comparing said difference in time to a predetermined time differential whereby the presence of a fault condition in said READ channel is detected.

4,506,306

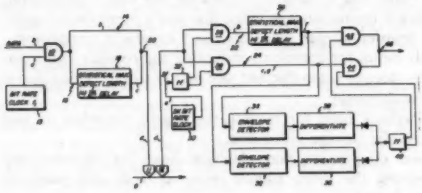
INTERLEAVED REDUNDANCY IN DATA RECORDING

Dominique H. Veillard, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 8, 1982, Ser. No. 440,142

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—47 **10 Claims**



1. Apparatus for assuring against the loss of data bits in the recording of such bits in a magnetic medium in which the statistically largest surface defect thereof has a size of a certain given length comprising

(a) means for producing first and second identical streams of data bits and for interleaving bit-by-bit said bits in such a way that, as recorded in said medium at a nominal recording speed, the bits of one stream are displaced from corresponding bits of the other stream by a distance that is at least said given length, said bits in said streams of data bits occurring at a given bit rate,

(b) magnetic head means,

(c) means for providing relative motion at said nominal recording speed between said magnetic head means and said medium, and

(d) means for applying said interleaved data bits to said magnetic head means for the recording thereof in said medium, whereby by separating the interleaved bit streams during playback, and by then bringing such bit streams into sync with each other, a dropout of bits from one stream will serve as a harbinger of a dropout of bits from the other stream, and vice versa, thereby to allow toggling between the bit streams to form an error-free bit stream that is identically like either said first or said second bit stream.

4,506,307

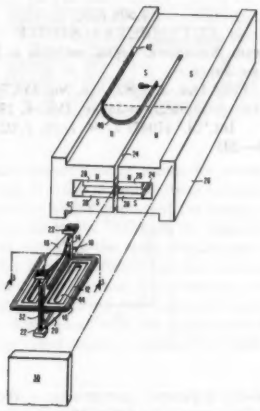
MAGNETIC HEAD SLIDER AND ACTUATOR ASSEMBLY

Robert B. Watrous, 7208 Golf Course La., San Jose, Calif. 95139

Filed Nov. 10, 1981, Ser. No. 320,166

Int. Cl.³ G11B *5/55, 5/60, 21/10*

U.S. Cl. 360—106 **8 Claims**



1. In an actuator assembly for moving at least one magnetic transducer radially relative to concentric recording tracks on the surface of a rotating magnetic disk on a disk file, said assembly including a movable armature member and a stationary stator member that are movable bidirectionally relative to each other along a predetermined axis parallel to said radial direction in response to the interaction between current flowing in a coil attached to said movable member and the flux produced by permanent magnets attached to said stationary stator member,

an improved externally supplied air bearing system arranged to minimize the length of said moving armature member for a given stroke of said actuator assembly in order to reduce the mass of the armature and thereby increase the acceleration and seek time of said actuator, raise the natural frequencies of the armature bearing system, decrease the volume of externally supplied air to said bearing system, and reduce the air pressure required to maintain said armature member in a spaced apart, relatively stiff air bearing relationship relative to said stator member, said system having

(a) at least one pair of parallel disposed cooperating air bearing surfaces which guide the mass of said armature during movement, one of which is associated with said stator member and the other of which is associated with said armature member,

(b) said armature having a relatively shallow plenum for distributing air equally to said pair of parallel bearing surfaces to establish said relatively stiff air bearing relationship,

(c) said other bearing surface of said armature surrounding said plenum and being a continuous bearing surface, a major portion of which is disposed adjacent the perimeter of said armature member and including a pair of segments disposed transverse to said radial direction, and

(d) means associated with said stationary member for supplying a predetermined volume of air at a predetermined

pressure to said plenum of said armature member, said stroke being substantially equal to the lengthwise dimension of said armature member in said radial direction minus the widths of said pair of segments.

4,506,308

MAGNETIC HEAD ASSEMBLY

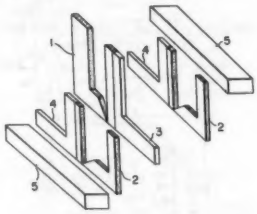
Shinji Furuichi, Kumagaya; Shigetoshi Morita, Saitama; Shunichi Taka, and Hirohisa Suwabe, both of Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,448

Claims priority, application Japan, Oct. 7, 1981, 56-159595

Int. Cl.³ G11B *5/12, 5/27, 5/42;* **H01F** *7/06*

U.S. Cl. 360—121 **4 Claims**



1. A magnetic head assembly comprising: a read/write head unit for reading or writing data and having a magnetic core provided with a thin sheet of an Mn-Zn ferrite; and erase heads bonded to said read/write head unit and adapted to erase the edge portions of said data, said erase head units having magnetic cores of Ni-Zn ferrite provided with thin sheets of an Ni-Zn ferrite; the bonding between said read/write head unit and said erase head units being made by means of a glass.

4,506,309

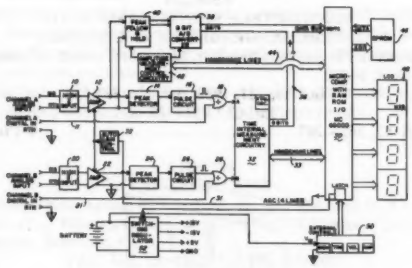
TAPE DRIVE CALIBRATION METER

Kyriacos Joannou, Wayland, and William P. Coots, West Bridgewater, both of Mass., assignors to Pericomp Corporation, Natick, Mass.

Filed Dec. 17, 1982, Ser. No. 450,539

Int. Cl.³ G11B *5/46, 27/36*

U.S. Cl. 360—137 **16 Claims**



1. A tape drive calibration meter for displaying any one of a number of different parameters to be calibrated comprising;

input circuit means defining first and second signal channels each receiving a detected signal from a read head associated with the tape drive,

time interval measurement means coupled from said input circuit means and including means for providing a digital signal representative of the time difference between signals on the first and second signal channels,

peak amplitude detection means coupled from said input circuit means and including means for providing a digital signal representative of peak amplitude of a signal on one of said signal channels,

and data processing and display means receiving said time difference digital signal and said peak amplitude digital signal and displaying numbers representative of time difference and peak amplitude.

4,506,310

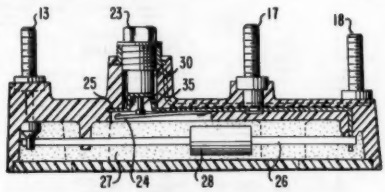
PRECISION FUSING ARRANGEMENT

Alfred O. Schwarz, Parsippany, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 19, 1984, Ser. No. 590,964

Int. Cl.³ H02H *5/04*

U.S. Cl. 361—104 **8 Claims**



1. A circuit protector comprising an insulative base having an elongated cavity,

a line terminal held within the base and protruding into one end portion of the cavity,

a station terminal held within the base and protruding into the other end portion of the cavity,

a fuse link connected between the line and station terminals within the cavity, and

a pellet of insulating foam enclosing a portion of the fuse link, the pellet of insulating foam being a material that shrinks away from the fuse link when the fuse link generates heat upon conducting a fault current for producing a cavity around the fuse link to provide a localized potential hot spot with precise fusing properties.

4,506,311

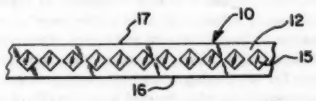
LIGHTNING DIVERTER STRIP WITH DIAMOND-SHAPED CONDUCTING SEGMENTS

Jay D. Cline, Ft. Lauderdale, Fla., assignor to Dayton-Granger, Inc., Ft. Lauderdale, Fla.

Filed Sep. 22, 1983, Ser. No. 534,917

Int. Cl.³ H05F *3/00*

U.S. Cl. 361—218 **3 Claims**

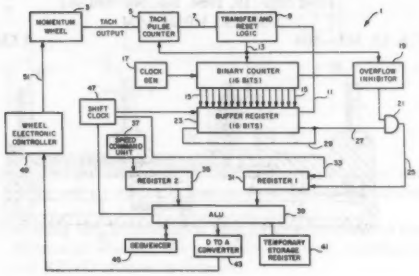


1. A lightning diverter strip including a plurality of conductive plates resistively coupled on a substrate base, arranged longitudinally on a strip in spaced apart relation, the improvement comprising each of said plates formed in a generally rectangular shape substantially flush with the top surface of said strip, said plates being oriented with respect to each other such that a corner of one plate is in longitudinal alignment with a corner of an adjacent plate so that the break-down potential between adjacent plates is reduced.

4,506,312
APPARATUS FOR CONTROLLING THE SPEED OF A ROTATING BODY

Fred N. Chan, Atherton, and Ernest E. Wuethrich, Santa Clara, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Continuation of Ser. No. 356,571, Mar. 9, 1982, abandoned. This application Sep. 23, 1983, Ser. No. 534,403
Int. Cl.[3] G01P *3/44*
U.S. Cl. 361—240 15 Claims



1. Apparatus for controlling the speed of a rotating body, comprising:

tachometer means mechanically coupled to said rotating body to sense cyclic passage of a specific angular index of rotation relative to a position of a reference thereby to eliminate pulse-to-pulse jitter for generating a periodic electrical pulse signal, said periodic electrical pulse signal having a period which is an integral multiple of the period of rotation of said angular index, which period is inversely proportional to the rotational frequency of said body;

free-running counter means operative at a fixed clock frequency substantially greater than said rotational frequency and connected to receive said periodic pulse signal of said tachometer means for continuously counting at said fixed frequency and accumulating a count value throughout each said period of said periodic pulse signal, said counter means being operative to respond to each said periodic pulse signal by resetting said count value to zero and being operative to continuously produce a digital electrical signal which is a numerical representation of said count value at the end of the most recent period of said periodic pulse signal and which is precisely indicative of time length of said periodic pulse signal period;

means for producing a command digital reference signal representative of a desired time length of said periodic pulse signal period;

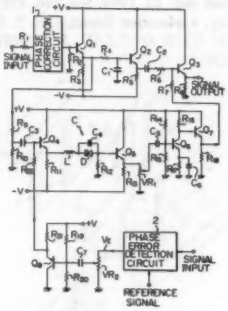
period comparator means for comparing said digital electrical signal with said command digital reference signal, and for generating in response to a measured difference therebetween a speed control signal having a magnitude representative of said difference; and

speed control means connected to said period comparator means to vary the rotational speed of said rotating body in response to said speed control signal in a sense to continuously minimize said difference between said digital electrical signal and said digital reference signal.

4,506,313
TIME AXIS CORRECTION DEVICE FOR A SIGNAL REPRODUCED FROM A RECORDING MEDIUM

Takashi Okano, Tokorozawa, Japan, assignor to Pioneer Video Corporation, Tokyo, Japan

Filed Aug. 12, 1982, Ser. No. 407,624
Claims priority, application Japan, Aug. 13, 1981, 56-126880
Int. Cl.[3] H04N *9/493*
U.S. Cl. 358—320 2 Claims



1. A time axis correction device for treating an input signal having time axis fluctuation, comprising:

an error signal generation means for generating an error signal corresponding to the magnitude of an error of the time axis of the input signal;

a phase modulation means responsive to said error signal for treating the input signal, comprising a phase modulation transmission network including a variable impedance element whose impedance is varied with said error signal, the phase transmission characteristic of said phase modulation means being dependent on the impedance of said variable impedance element;

a first amplifier for receiving said input signal;

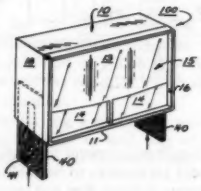
a second amplifier for inverting the output signal of said phase modulation means; and

a mixer means for additively mixing the output signals of said first and second amplifiers.

4,506,314
SUBMERSIBLE SIGNAL LAMP WITH INTERCHANGEABLE LENS ASSEMBLY

Dennis G. Moore, 2602 Superior, Livermore, County of Almeda, Calif. 94550

Filed Sep. 21, 1983, Ser. No. 534,336
Int. Cl.[3] F21V *29/00*
U.S. Cl. 362—267 8 Claims



1. In a submersible electric lamp having an air impervious housing defining an enclosure for retaining a predetermined volume of air, and having an opening through which a limited amount of water may pass into the housing upon submersion of the housing in water to a level below said opening thereby trapping the air within the housing and creating a force sufficient to prevent the water from rising above a predetermined

level, and an electric lamp carried within said housing above said predetermined level, the improvement comprising

retaining means within said housing for selectively retaining a lens and reflector module inserted within said housing in optical alignment with said electric lamp, and

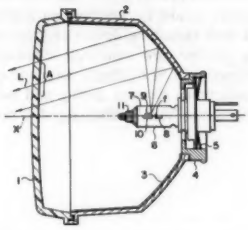
at least one lens and reflector module selectively insertable into engagement with said retaining means in said housing for positioning said lens and reflector module in optical alignment with said electric lamp.

4,506,315

VEHICLE HEADLAMP

Masashi Maekawa, Atsugi, and Tatsumi Hasegawa, Hatano, both of Japan, assignors to Ichikoh Industries, Ltd., Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,885
Int. Cl.³ F21V 7/00
U.S. Cl. 362—308 **7 Claims**



1. A vehicle headlamp comprising:

a reflector body having an open end and defining a substantially parabolic surface having a focal point;

a lens made of synthetic resin and attached to said open end of said reflector body and,

a lamp comprising at least one filament in a glass envelope, said lamp being attached to said reflector body such that said filament is positioned ahead of said focal point;

said parabolic surface comprising a smooth reflecting surface for reflecting light from said lamp through said lens and an uneven light reducing zone positioned to reduce the amount of light reflected from said lamp to an upper area of said lens;

said smooth reflecting surface comprising a smooth undercoat applied over a desired portion of said parabolic surface of said reflector body and a reflecting coating applied over said undercoat, and

said uneven light reducing zone comprising said reflecting coating applied directly onto said reflector body.

4,506,316

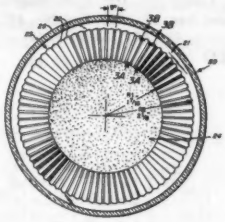
PAR SPOT LAMP

William Thiry; Arnold E. Westlund, Jr., and Clarence D. Puckett, all of Winchester, Ky., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 18, 1983, Ser. No. 524,507
Int. Cl.³ F21V 7/00
U.S. Cl. 362—309 **12 Claims**

1. In a spot lamp including a reflector portion, a lens member adjacent said reflector portion, and a light source disposed within said reflector portion and substantially surrounded thereby, the improvement wherein said lens member comprises:

a substantially curved member having an inner surface including therein a substantially centrally disposed stippled portion and a series of radially disposed flutes defining a fluted portion substantially surrounding said centrally disposed stippled portion, each of said flutes extending linearly from adjacent said stippled portion outwardly in a



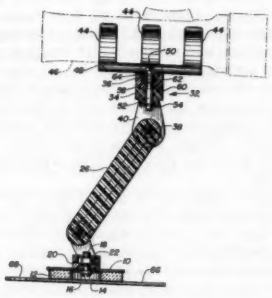
radial manner to a location substantially adjacent the outer edge of said curved member.

4,506,317

MAGNETIC SUPPORT FOR FLASHLIGHT

James J. Duddy, 514 N. Metcalf St., Lima, Ohio 45801

Filed Feb. 8, 1984, Ser. No. 577,973
Int. Cl.³ F21V 21/00
U.S. Cl. 362—396 **2 Claims**

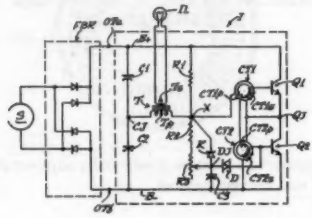


1. A magnetically attachable light adapted to be removably supported upon steel or iron-containing objects by firm magnetic connection and comprising in combination, a base plate of flat geometric configuration, flat elastomeric magnet means affixed to one surface of said plate, a yoke affixed to the opposite surface of said plate and extending substantially perpendicularly therefrom, an elongated arm pivotally attached at one end to said yoke, an elastic C-shaped metallic clamp member complementary to the body portion of a battery-type flashlight and comprising an elongated substantially shallow channel connected to and supporting three similar pairs of relatively narrow curved arms connected at one end respectively to opposite sides of said channel and respectively comprising individual C-shaped clamp members spaced longitudinally along said channel, and adapted to releasably engage said body portion at spaced intervals therealong and support said flashlight coaxially with said clamp member, and a swivel unit having a first member connected to said clamp member and a second member pivotally connected to the other end of said arm, whereby a flashlight when mounted in said clamp member is capable of universal positioning relative to a supporting object to which said magnet means is attached.

4,506,318
INVERTER WITH CONTROLLABLE RMS OUTPUT VOLTAGE MAGNITUDE

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Apr. 22, 1983, Ser. No. 487,817
Int. Cl.³ H02M 7/44
U.S. Cl. 363—132 8 Claims



1. A power supply adapted to be powered from the relatively low frequency voltage on a regular electric utility power line and to provide a relatively high frequency output voltage, comprising:

rectifier means connected with said power line and operative to provide a DC supply voltage, said DC supply voltage being characterized by having an instantaneous undirectional magnitude that is substantially equal to the instantaneous absolute magnitude of said low frequency voltage, whereby said instantaneous unidirectional magnitude increases above a certain threshold level once for each half-cycle of said relatively low frequency voltage and decreases below said certain threshold level once for each half-cycle of said relatively low frequency voltage;

inverter connected with said DC supply voltage and operative to provide said relatively high frequency output voltage, said inverter characterized by: (i) ceasing operation each time the instantaneous magnitude of said DC supply voltage decreases below said certain threshold level, (ii) resuming operation each time after the magnitude of said DC supply voltage has increased above said certain threshold level, but only if it is provided with a trigger signal; and

trigger means connected in circuit with said DC supply voltage and operable to provide said trigger signal to said inverter some pre-selected time-period after each time the magnitude of said DC supply voltage has increased above said certain threshold level, the duration of said pre-selected time-period being less than that of the half-period of said relatively low frequency voltage,

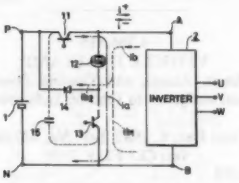
whereby said inverter starts and stops operation once during each half-cycle of said relatively low frequency voltage, thereby correspondingly providing said output voltage for only a pre-selected fraction of the duration of each half-cycle of said relatively low frequency voltage.

4,506,319
INDUCTIVELY COMMUTATED THYRISTOR INVERTER

Masahiko Akamatsu, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00109, § 371 Date Dec. 6, 1982, § 102(e) Date Dec. 6, 1982
PCT Filed Apr. 8, 1982, Ser. No. 451,653
Claims priority, application Japan, Apr. 8, 1981, 56-53975
Int. Cl.³ H02M 7/515
U.S. Cl. 363—138 5 Claims

1. A power converter apparatus comprising; a bridge circuit including a thyristor bridge having thyristors, and feedback diodes connected in inverse parallel relationship to said thyristors for conducting current in reverse direction to that of said thyristors; a solid-state switching device inserted in series in at least one of positive and negative lines interconnecting a DC power supply and DC input terminals of said bridge circuit for cutting off a current flowing from aid DC power supply to said bridge circuit when reverse-biasing said thyristors in said bridge circuit, a series-connected circuit of an inductance element and an auxiliary switching device connected between said positive and negative DC lines through said solid-state switching device, a reverse-conducting element for passing a

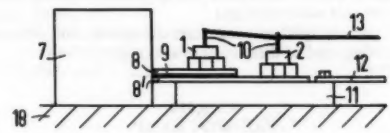


current in reverse direction to that of said solid-state switching device, and control means for creating an interval of time in which the solid-state switching device and the auxiliary solid-state switching device are rendered conductive simultaneously, the arrangement being that a magnetic energy will be stored in said inductance element during said interval of time, and the magnetic energy will be discharged to reverse-bias the thyristors.

4,506,320
POWER RECTIFIER ARRANGEMENT

Adam I. Koroncai, Klagenfurt, Austria, and Edmund R. Poetsch, Koenigsbrunn, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 31, 1983, Ser. No. 462,391
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3205650
Int. Cl.³ H02M 1/18
U.S. Cl. 363—141 3 Claims

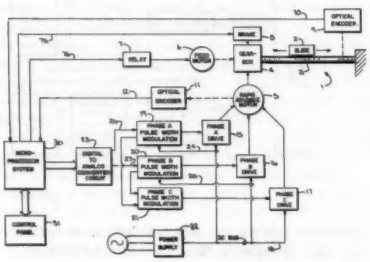


1. A power rectifier arrangement comprising: at least one rectifier unit including a housing, a floor in said housing, and an input terminal extending from said floor; heat sink means including at least one bore for receiving said input terminal; a cooled plate carrying said heat sink means; and a transformer mounted on said cooled plate and including a primary winding, and a secondary winding connected to said at least one rectifier unit, said secondary including a conductive ribbon structure comprising a plurality of electrically conductive layers each having a predetermined thickness dependent on the current penetration depth in order to prevent skin effect, which are pinched between said floor and said heat sink means when said input terminal is received in said bore.

4,506,321
MOTION CONTROL SYSTEM WITH ADAPTIVE DECELERATION

Robert H. Comstock, Andover; William P. Curtiss, Winthrop, and Donald E. Fulton, Stoneham, all of Mass., assignors to IMEC Corporation, Boston, Mass.

Filed Sep. 8, 1982, Ser. No. 416,357
Int. Cl.[3] G05B 13/00
U.S. Cl. 364—174 9 Claims



1. A control system for a movable element on a machine, the combination comprising:

a motor coupled to the movable element for moving the same;

a motor control coupled to the motor to operate it in response to a motion command signal;

acceleration control means coupled to the motor control for generating motion signals which accelerate the movable element from a start position to a rapid traverse velocity and which includes:

(a) velocity table storage means, and

(b) means for storing numbers in the velocity table storage means, which numbers are indicative of the motion generated by the acceleration control means during successive portions of the acceleration;

indicating means coupled to the motor control for sensing the velocity of the movable element and providing an indication when rapid traverse velocity is reached;

distance measuring means coupled to the movable element for indicating the distance traveled from its start position;

means enabled by the indicating means and coupled to the motor control for generating motion command signals which move the movable element at the rapid traverse velocity;

calculating means coupled to the indicating means and the distance measuring means for calculating a deceleration position which is a function of the distance traveled by the movable element during its acceleration from the start position to the position at which it reached rapid traverse velocity; and

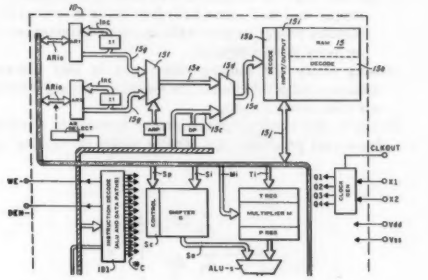
deceleration control means coupled to the distance measuring means and the calculating means for generating motion command signals to the motor control which decelerate the movable element from its rapid traverse velocity when the movable element reaches the calculated deceleration position, and in which

the deceleration control means includes means for reading successive numbers from the velocity table storage means to generate motion command signals during the deceleration of the movable element.

4,506,322
READ/WRITE MEMORY CELL FOR MICROCOMPUTER

Antony W. Leigh, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 22, 1982, Ser. No. 350,950
Int. Cl.[3] G06F 13/00
U.S. Cl. 364—200 18 Claims



1. A pseudo-static read/write memory cell comprising:

first and second driver transistors each having a current path and a control electrode, the control electrode of each driver transistor cross-coupled to one end of the current path of the other driver transistor to provide a bistable circuit;

first and second storage nodes, the first storage node being coupled to said one end of said current path of the first driver transistor, and the second storage node being coupled to said one end of said current path of the second driver transistor;

first and second access transistors each having a current path and a control electrode;

first and second data lines for read or write of a data bit and its complement, the current paths of the first and second access transistors respectively coupling the first and second storage nodes to the first and second data lines;

first and second refresh transistors each having a current path and a control electrode; the current path of the first refresh transistor directly connecting the first storage node to a voltage supply without intervening circuit elements; the current path of the second refresh transistor directly connecting the second storage node to said voltage supply line without intervening circuit elements;

a first address line connected to the control electrodes of the first and second access transistors; and

a second address line connected to the control electrodes of the first and second refresh transistors;

and means for applying a single clock voltage to said second address line to turn on said first and second refresh transistors to refresh said cell.

4,506,323
CACHE/DISK FILE STATUS INDICATOR WITH DATA PROTECTION FEATURE

Vladi Pusic, San Jose; Benjamin T. George, Sunnyvale, both of Calif.; Monte E. Smith, St. Paul, and Craig B. Johnson, Shoreview, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 3, 1982, Ser. No. 354,329
Int. Cl.[3] G06F 1/00
U.S. Cl. 364—200 10 Claims

1. In a system having a processor, a cache memory for storing segments of data, an addressable memory, a bulk memory, a storage control unit for controlling transfers of segments of data between said cache memory, said processor and said bulk memory, said storage control unit including means for

developing a count of the number of segments of data in said cache memory which have not been destaged to said bulk memory since being written to and storing said count in said addressable memory, and a memory power supply for powering said cache memory and said addressable memory, the improvement comprising:

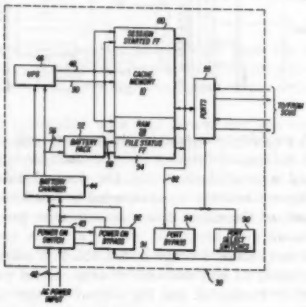
a standby power supply;

first and second flipflops,

said first flipflop being powered from said memory power supply and said second flipflop being powered by said standby power supply in the event of termination of said memory power supply;

sensing means for sensing said count in said addressable memory and producing a first signal indicating whether or not said count is zero;

means in said storage control unit responsive to a command from said processor for setting said first flipflop at the



beginning of a computing session, said first flipflop producing a second signal when it is set;

first means responsive to said first signal and said second signal for setting said second flipflop when said first flipflop is set and said first signal indicates said count is zero;

second means responsive to said first and second signals for resetting said second flipflop when said first flipflop is set and said first signal indicates said count is not zero; and,

means responsive to said first flipflop and said second flipflop for producing a good files signal when either said first or said second flipflop is set whereby said good files signal is produced during a computing session as long as said memory power supply supplies output power, and said good files signal is produced after said memory power supply ceases supplying output power if said second flipflop is set at the time said memory power supply ceases supplying output power.

4,506,324

SIMULATOR INTERFACE SYSTEM

Leonard D. Healy, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 8, 1982, Ser. No. 355,400

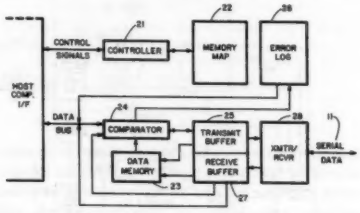
Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **11 Claims**

1. An intelligent linkage for data transfer between a host computer and external devices where the data to be transferred are variable based on control and status data, comprising in combination:

a microprocessor based master processor having first means coupled to said host computer for controlling data transfer from said host computer to said master processor, first means connected to said first data transfer controlling means for determining changes in data received from said host and determining the appropriate external device associated therewith, first means connected to said said first determining means for communicating said changes in data to said external device via a microprocessor based slave processor, and second means coupled to said host computer and to said slave processor for controlling data transfer from said master processor to said host computer;

said microprocessor based slave processor having third means coupled to said external device for controlling the transfer of status data from said external device to said slave processor, second means connected to said third controlling means for determining changes in said data received from said external device, second means con-



nected to said second determining means for communicating said changes in data to said host computer via said master processor, fourth means coupled to said external device for controlling data transfer from said slave processor to said external device; and

means coupling said second data communicating means of said slave processor and said second controlling means of said master processor, and said first data communicating means of said master processor and said fourth data controlling means of said slave processor, for serial transmission of said data.

4,506,325

REFLEXIVE UTILIZATION OF DESCRIPTORS TO RECONSTITUTE COMPUTER INSTRUCTIONS WHICH ARE HUFFMAN-LIKE ENCODED

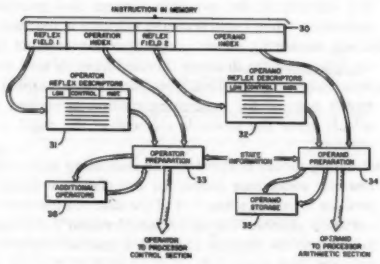
Donald B. Bennett, and John W. Esch, both of Burnsville, Minn., assignors to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 133,191, Mar. 24, 1980, abandoned.

This application Nov. 15, 1982, Ser. No. 441,962

Int. Cl.³ G06F *5/00*; H03K *13/00*

U.S. Cl. 364—200 **21 Claims**



11. A method of first encoding a multiplicity of fixed bit length operand quantities into a like multiplicity of variable bit length encoded first words and into a plurality of encoded second words, and then for later decoding, or reconstituting, one said fixed length operand quantities utilizable in instruction execution by the processor of a digital computer from one said varible bit length encoded first words and from a corresponding associated one said variable bit length encoded second words which said method comprises:

establishing, or encoding said multiplicity of fixed bit length

operand quantities in a like multiplicity of variable bit length first memory words—called an ENCODED OPERANDS, consisting of a fixed bit length first field, called a REFLEX field, and a variable bit length second field, called an OPERAND INDEX field—and emplacing said multiplicity of first memory words within a first memory store as a continuum;

further establishing, or encoding, said multiplicity of fixed bit length operand quantities into a plurality of fixed bit length second memory words—called an OPERAND REFLEX DESCRIPTOR, consisting a first bit length first field, called a LENGTH field, and a fixed bit length second field, called an DATA field—and emplacing said plurality of second memory words within addressable locations of a second memory store;

firstly retrieving plural contiguous ones of said variable bit length first memory words from the continuum of said multiplicity of such words within said first memory stores;

addressably secondly retrieving in accordance with the contents of a first-word first-field—the REFLEX field—of said first retrieved first memory word the uniquely associated addressable one of said plurality of second memory words from said second memory stores;

formulating a quantity in consideration of a second-word first-field—the LENGTH field—of said secondly retrieved one of said plurality of second memory words—the OPERAND REFLEX DESCRIPTOR—by

taking as first consecutive zeros that number of bits equal in numbers to the length of said first-word first-field—the REFLEX field—and

taking additional consecutive bits of a first-word second-field—the OPERAND INDEX field—said first-word second-field being those contiguous bits beyond said first-word first-field,

to that total number of consecutive bits as equal the contents of said second-word first-field—the LENGTH field—of said secondly retrieved one of said plurality of second memory words, and

combining as a fixed length sum said formulated quantity and a second-word second-field—the DATA field—as said fixed length operand quantity;

whereby since said first memory words are stored within said first memory store as a continuum, meaning as something of which no distinction of content can be affirmed except by reference to something else, then said something else by which said first memory words are distinguishably referenced is thusly seen to be said secondly retrieved one of said plurality of second memory words as utilized in said formulating step;

whereby if said contents of said LENGTH field of said addressed OPERAND REFLEX DESCRIPTOR are less than or equal to the number of bits within said fixed length REFLEX field, then said formulated quantity will equal zero;

whereby thusly is said ENCODED OPERAND incorporating as a second field said variable bit length OPERAND INDEX field, also of variable bit length;

whereby said fixed length operand quantity is reconstituted of a continuum of variable bit length first memory words and of fixed length second memory words.

4,506,326

APPARATUS AND METHOD FOR SYNTHESIZING A QUERY FOR ACCESSING A RELATIONAL DATA BASE

Philip S. Shaw, San Jose; Joseph J. Sordi, Los Gatos, and Irving L. Traiger, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,821

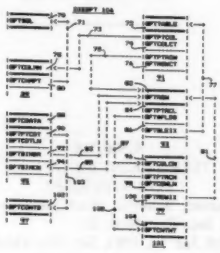
Int. Cl.[3] **G06F** *15/40*

U.S. Cl. 364—300 **14 Claims**

1. A method for operating a computing apparatus to translate into a linear query a graphic language query expressed as one or more elements, including example elements and implied operand predicates, appearing in rows and columns of an example table including one or more source and target tables and, optionally, in condition blocks, comprising the steps of:

generating row names into a row name table having one entry for each row in a source table;

for each data field within each row named in said row name table which contains an example element definition or implied operand predicate, generating and loading into a column data table an entry specifying the row name, column name, and data; and



generating into a conditions table an entry containing a basic predicate for each column data table entry containing an implied operand predicate or an example element having an implied condition;

thereby establishing in said row name table, column data table, and conditions table a data structure for synthesizing into a linear query a graphic language query specified as a target point query, or a combined print query, or an insert query, or an update query, or a delete query.

4,506,327

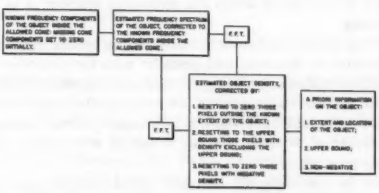
LIMITED-ANGLE IMAGING USING MULTIPLE ENERGY SCANNING

Kwok C. Tam, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,856

Int. Cl.[3] **G06F** *15/42;* **H04N** *5/32*

U.S. Cl. 364—414 **4 Claims**



1. A method of limited-angle tomographic reconstruction for radiation imaging of composite objects composed of at least two component substances, said method comprising the steps of:

scanning the composite object at many scan angles over a limited angular range using an imaging agent at different energies, where the number of energies is at least equal to the number of component substances;

generating detected signals which are projections of the composite object in the limited angular range at the different energies;

decomposing said composite object projections into projections of each component substance;

producing a reconstructed image of each component substance from its projections and known physical parameters of the object and substances, which are the finite

extent of the composite object, the upper bound of the density of each component substance, and that there are no negative densities, the latter two being nonlinear constraints; and

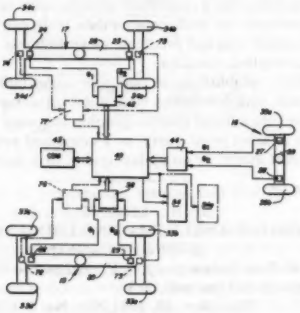
superimposing said reconstructed images to yield a tomographic reconstruction of the composite object.

4,506,328

STATIC LOW TIRE PRESSURE DETECTION SYSTEM FOR AIRCRAFT

Charles D. Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Rockford, Ill.

Filed Jul. 30, 1982, Ser. No. 403,454
Int. Cl.³ B06C *23/00*
U.S. Cl. 364—463 **17 Claims**



1. A low tire pressure detection system for detecting an underpressurized condition of a tire mounted on a structural member of an aircraft when the structural member is at rest, comprising:

first and second inclinometers disposed in spaced-apart relationship on the structural member with the sensitive axes of the inclinometers being parallel to one another, the first and second inclinometers developing first and second output signals representing the angle of the structural member at first and second locations with respect to a reference plane;

means for summing the first and second output signals to develop a weight signal representing the weight on the member;

means for subtracting the first and second output signals to develop an angle signal representing the overall angle of the structural member with respect to the reference plane;

means for storing the weight and angle signals developed at a particular time;

means for comparing subsequent weight and angle signals with the stored weight and angle signals to derive weight and angle difference signals; and

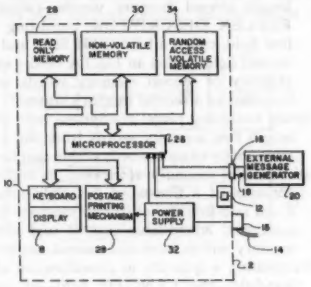
means for deriving an indication of tire pressurization including a lookup table in which is stored a plurality of tire pressure signals and means for addressing the lookup table with the weight and angle difference signals to cause the lookup table to develop a signal representing tire pressurization.

4,506,329

NON-VOLATILE MEMORY SERIAL NUMBER LOCK FOR ELECTRONIC POSTAGE METER

Edward C. Duwel, Trumbull, Conn., and John H. Soderberg, Monroe, N.Y., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 8, 1982, Ser. No. 355,437
Int. Cl.³ G06F *3/00, 15/00*
U.S. Cl. 364—464 **13 Claims**



1. A postage meter, comprising:

printing means for printing postage;

a computing means coupled to said printing means for accounting for postage printed by said printing means;

data entry means coupled to said computing means for entering messages into said computing means;

non-volatile memory means coupled to said computing means;

a program store coupled to said computing means and adapted to store programs to control the operation of said computing means; and

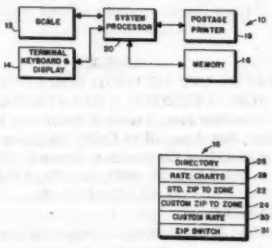
said program store containing a one time actuable program operable to cause said computing means to compare a serial number message including an operational indicator bit and a first serial number entered into the postage meter with a previously entered postage meter serial number and operable to cause said computing means to set lock bit preventing reentry into the program if a comparison is obtained indicating the two serial numbers are identical when an operation indicator bit in said entered serial number message is set indicating a desire to utilize the entered serial number.

4,506,330

ELECTRONIC MAILING APPARATUS AND METHOD

Daniel F. Dlugos, Huntington, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 6, 1982, Ser. No. 395,398
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—466 **10 Claims**



1. An improved electronic mailing apparatus for indicating

postage for a plurality of classes of postal service, said service having a number of standard zip to zone conversion tables, said apparatus comprising:

a. a scale means, a terminal means, a memory means and a processor means;

b. said processor means intercoupling said scale, terminal and memory means for providing an indication of postage for a parcel based on the weight of the parcel, class of service and destination zone;

c. said memory means including a first memory storage means for storing standard zip to zone conversion table data for originating zip code locations;

d. said memory means including a second memory storage means for storing custom data for a limited number of zip zone conversion tables less in number than the number of standard zip to zone conversion tables;

e. said custom zip to zone conversion table being based on distances, and modified to reflect a different rate structure when a destination zip location shares a common Bulk Mailing Center with the originating zip location; and,

f. means for addressing a one of said limited number of zip to zone conversion tables.

4,506,331

NUMERICAL CONTROL METHOD

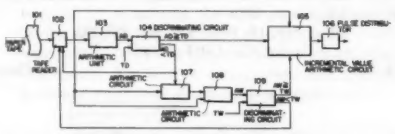
Hajimu Kishi, Hino; Masaki Seki, Takaidonishi, and Kunio Tanaka, Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Filed Jun. 18, 1982, Ser. No. 389,936

Claims priority, application Japan, Jun. 20, 1981, 56-95639; Jun. 20, 1981, 56-95640

Int. Cl.³ G06F *15/46;* G05B *19/41*

U.S. Cl. 364—474 **4 Claims**



3. A numerical control method for controlling a machine tool having a movable element, in which a curve is approximated by straight line segments, numerically controlled machining is performed in accordance with numerical control data, including a positional command comprising one block of data, for each of said straight line segments, and preprocessing of said numerical control data is executed by prereading a positional command of a next succeeding block of data while executing numerically controlled machining based on a current block of data, said numerical control data being generated by the steps of:

(a) reading the coordinates of the start and end points of a straight line segment and a permissible travelling distance TD;

(b) computing the length AD of the straight line segment;

(c) comparing the magnitude of said length AD against the magnitude of the permissible travelling distance TD;

(d) when the condition AD≧TD holds, generating numerical control data for moving the movable element along said straight line segment; and

(e) when the condition AD<TD holds, omitting the generation of said numerical control data for moving the movable element along said straight line segment.

4,506,332

FACILITY FOR MONITORING THE LEVEL OF A RADIO-FREQUENCY SIGNAL

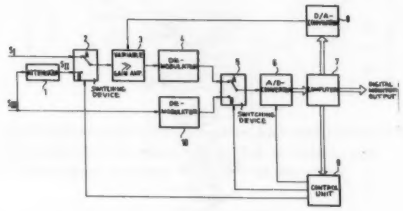
Samuel Bloch, Stuttgart; Klaus Bressler, Ditzingen; Horst Idler, Stuttgart, and Herbert Kleiber, Ludwigsburg, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 28, 1982, Ser. No. 343,491

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1981, 3103118

Int. Cl.³ G01R *19/00*

U.S. Cl. 364—483 **7 Claims**



1. Apparatus for monitoring the level of a radio-frequency signal, particularly for monitoring the signals radiated by navigation systems, wherein the signal to be monitored is amplified in an amplifier before being passed on to an evaluating device, comprising:

first switching device which, depending on its switch position, passes either said radio-frequency signal to be monitored or a second relatively constant radio-frequency signal to said amplifier;

means deriving said second signal comprising an attenuator responsive to a third radio-frequency signal whose level is considerably higher and relatively constant, vis-a-vis that of the signal to be monitored;

means directing the amplified signal to an evaluating device by a first path, while said third signal reaches said evaluating device by a second path; and

means within said evaluating device for determining and comparing the levels of the amplified second signal and the third signal, and generating a signal to regulate the gain of said amplifier so that a desired value is reached if the level ratio of the second to third signals deviates from said desired value.

4,506,333

DEVICE FOR MEASURING THE PHASE ANGLE BETWEEN A SINE WAVE SIGNAL AND A CYCLIC LOGIC SIGNAL OF THE SAME FREQUENCY

Pascal Porrot, and Daniel Rougeolle, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 21, 1982, Ser. No. 400,490

Claims priority, application France, Jul. 24, 1981, 81 14420

Int. Cl.³ G06F *15/31;* G06G *7/22*

U.S. Cl. 364—487 **4 Claims**

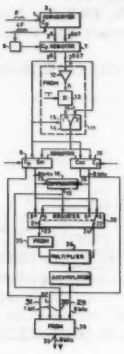
1. A device for measuring the phase angle between a sine wave signal and a cyclic logic signal of the same frequency with, on the input of the sine wave signal, an analog-digital sampling converter, wherein it comprises:

a frequency multiplying circuit, which transforms the cyclic logic signal of frequency F into a cyclic logic signal of frequency 4F for the purpose of sampling the A-D converter at a rate of 2 samples per half-cycle of the sine wave signal, said samples being representative of sin ϕ and cos ϕ, displaced by $\pi/2$;

a circuit for extracting from the sample supplied by the A-D converter absolute values of A sin ϕ and A cos ϕ, A being the amplitude of the sine wave signal, as well as the signs of sin ϕ and cos ϕ;

a circuit for calculating the absolute value of tan ϕ or cot ϕ on the basis of the absolute value of A sin ϕ and A cos ϕ, as a function of whether A sin ϕ<A cos ϕ or A sin ϕ>A cos ϕ, with the elimination of the amplitude A;

an accumulator which stores a plurality of data tan ϕ cot ϕ and restores a mean value therefrom;



a programmable read only memory receiving on its inputs digital data representing tan ϕ or cot ϕ, from the operation performed either in tan ϕ or cot ϕ, of the sign of cos ϕ and the sign of sin ϕ, and which supplies at its outputs digital information representing the phase angle ϕ.

4,506,334

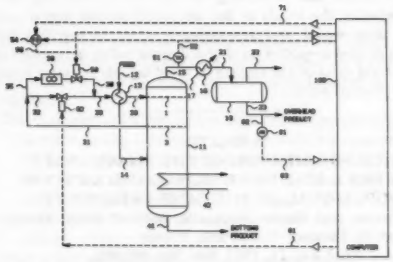
FRACTIONAL DISTILLATION COLUMN CONTROL

Robert J. DiBiano, c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Filed Oct. 26, 1982, Ser. No. 436,882

Int. Cl.[3] B01D *3/42*

U.S. Cl. 364—501 **16 Claims**



1. Apparatus comprising:

a fractional distillation column means;

a heat exchanger means;

means for supplying a feed stream through said heat exchanger means to said fractional distillation column means;

means for withdrawing a pump around stream from a first upper portion of said fractional distillation column means and for passing said pump around stream through said heat exchange means to a second upper portion of said fractional distillation column means, wherein said second upper portion is above said first upper portion;

a first cooling means;

means for diverting said pump around stream through said first cooling means;

a second cooling means;

an overhead accumulator means;

means for withdrawing an overhead vapor stream from an upper portion of said fractional distillation column means and for passing said overhead vapor stream through said first cooling means to said overhead accumulator means;

means for withdrawing a liquid stream from said overhead accumulator means as an overhead product stream;

means for establishing a first signal representative of a desired specification for said overhead product stream;

means for establishing a second signal representative of the actual value of said desired specification for said overhead product stream;

means for comparing said first signal and said second signal and for establishing a third signal which is responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the temperature of said overhead vapor stream required to maintain the actual value of said desired specification substantially equal to the desired value represented said first signal;

means for establishing a fourth signal representative of the actual temperature of said overhead vapor stream;

means for comparing said third signal and said fourth signal and for establishing a fifth signal which is responsive to the difference between said third signal and said fourth signal;

means for manipulating the flow rate of said pump around stream through said first cooling means in response to said fifth signal;

means for subtracting a desired temperature from said third signal to establish a sixth signal;

means for comparing said fourth signal and said sixth signal and for establishing a seventh signal which is responsive to the difference between said fourth signal and said sixth signal; and

means for manipulating the flow rate of the portion of said pump around stream which is not passed through said first cooling means in response to said seventh signal.

4,506,335

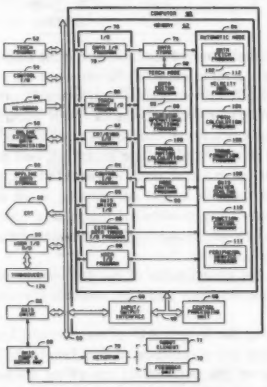
MANIPULATOR WITH CONTROLLED PATH MOTION

Timothy J. Magnuson, Tyler, Tex., assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jun. 10, 1982, Ser. No. 387,233

Int. Cl.[3] G06F *15/46*

U.S. Cl. 364—513 **3 Claims**



1. An apparatus for moving a function element in response to input signals defining, with respect to a first coordinate system, a sequence of positions of a tool centerpoint associated with the function element and path velocities therebetween, the tool centerpoint following a predetermined path between any two

successive positions, the tool centerpoint velocity along the predetermined path subject selectively to variation in accordance with a predetermined acceleration function and unprogrammed variations of a control parameter, the apparatus comprising:

(a) a manipulator upon which the function element is mounted, the manipulator having;

(1) a plurality of members describing a plurality of axes of motion, at least two of the members being linked by the axes of rotation, the members and axes of motion defining a generalized coordinate system, and

(2) a plurality of actuators, each member having associated therewith at least one actuator for effecting motion of the member,

(b) a manipulator control including a servomechanism circuit connected to the actuators to control motion of the members, the control executing the steps of;

(1) producing an increment interval signal representing a period for completion of an increment of motion of the tool centerpoint along a predetermined path,

(2) producing an increment velocity signal representing the path velocity of the tool centerpoint during the increment period,

(3) producing end point coordinate signals in response to the increment interval signal and the increment velocity signal, the end point coordinate signals representing coordinates with respect to the first coordinate system of an intermediate point along the predetermined path,

(4) producing a set of machine coordinate signals in response to the end point coordinate signals, the machine coordinate signals representing coordinate values of the intermediate point relative to the generalized coordinate system,

(5) applying the set of machine coordinate signals to the servo mechanism circuit to effect coordinated motion of the members to move the tool centerpoint to the intermediate point,

(6) Iterating steps 1 through 6 to cause the tool centerpoint to move through a series of increments along the path, and

(7) selectively accelerating and decelerating the tool centerpoint by modifying the increment velocity signal during the iteration of steps 1 through 6, the modifications being effected in response to, selectively, the predetermined function of acceleration and the unprogrammed variations of the control parameter.

4,506,336

POINT LOCATION AND GRAPHICS DISPLAY APPARATUS

Edwin A. Hird, 10200 DeSoto Ave., #331, Chatsworth, Calif. 91311

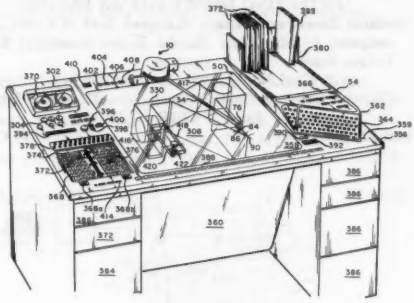
Filed Sep. 23, 1980, Ser. No. 189,754
Int. Cl.[3] G06K *11/00*
U.S. Cl. 364—518 **33 Claims**

1. A point location system comprising:

a digitizer including

a normally straight tape being cross-sectionally curved defining a narrow tape width and concave and convex tape surfaces, and the tape including a plurality of holes longitudinally disposed adjacent at least one of its edges; the tape having the resiliency to be bent in a radius toward its concave surface, and the width of the tape being normally flattened where so bent and the tape having the tendency to return to its straight orientation;

a rotatable roller for receiving a length of said tape concave surface bent in a radius thereagainst, and the roller including sprockets for engaging with said holes, and the sprockets including inclinations and alignment lands, and said holes thereby transversely sliding upon said inclinations to



said lands as said roller is rotated and said tape width is flattened and said holes engage said sprockets; and

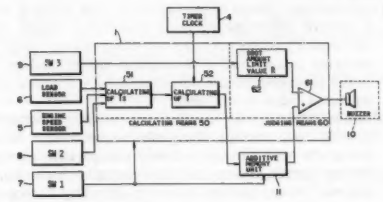
a shaft coaxially mounted to said rotatable roller.

4,506,337

ENGINE LUBRICATING OIL REPLACEMENT TIMING MONITORING SYSTEM AND METHOD FOR AN AUTOMOTIVE VEHICLE

Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 6, 1982, Ser. No. 395,839
Claims priority, application Japan, Jul. 29, 1981, 56-118694
Int. Cl.[3] G01D *21/00*
U.S. Cl. 364—550 **24 Claims**



1. An engine lubricating oil replacement timing monitoring system for an automotive vehicle which indicates to a vehicle occupant the end of service life of the engine lubricating oil, comprising:

(a) a first sensor which detects the engine speed (n);

(b) a second sensor which detects the load on the engine (L);

(c) a calculating means which calculates the amount of soot (T) presently contained in the engine lubricating oil from the detected values of said first and second sensors;

(d) a memory means which receives and additively stores the calculated amount of soot in the engine lubricating oil from said calculating means so as to record the total amount of soot therein;

(e) a judging means which judges whether the total amount of soot additively stored in said memory means arrives at a first predetermined amount (R), the first predetermined amount being a maximum allowable amount of soot suspended in the engine lubricating oil; and

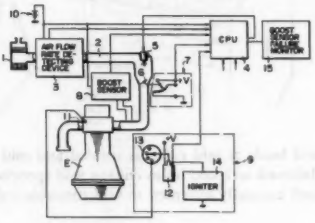
(f) an alarm unit which produces an alarm to the vehicle occupant when said judging means judges that the total amount of soot becomes equal to the first predetermined amount.

4,506,338

METHOD AND APPARATUS FOR JUDGING THE STATE OF OPERATION OF AN INTAKE PASSAGE PRESSURE DETECTING DEVICE FOR AN ENGINE

Yoshiaki Danno, and Tatsuro Nakagami, both of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,743
Claims priority, application Japan, Nov. 27, 1980, 55-167088
Int. Cl.³ G01R *31/28*
U.S. Cl. 364—551 25 Claims



1. An apparatus for judging the state of operation of an intake passage pressure detecting device for an engine, comprising:

an intake passage pressure detecting device for an engine for detecting an intake passage pressure of the engine,

a power-on reset circuit for providing a reset output when power is turned on,

a memory circuit for storing an initial output value from said intake passage pressure detecting device at the beginning of a fuel feed control (for the feed of fuel to the engine) upon receipt of signals respectively from said power-on reset circuit and from said intake passage pressure detecting device,

a comparison/change detecting circuit for judging whether a relative difference between said initial output value of said intake passage pressure detecting device stored in said memory circuit and a subsequent output value of said intake passage pressure detecting device is above a predetermined value or not, and

a failure output circuit which (for providing a judge failure output) upon receipt of signals (respectively) from said power-on reset circuit and said comparison/change detecting circuit, outputs a failure signal which represents that said intake passage pressure detecting device is in a state of failure during the period from the beginning of the fuel feed control until said relative difference is judged by said comparison change detecting circuit to be above said predetermined value and outputs a failure cancellation signal which represents that said intake passage pressure detecting device is in a state of normal operation after said relative difference is judged by said comparison/change detecting circuit to exceed said predetermined value.

4,506,339

METHOD AND APPARATUS FOR MEASURING AND MONITORING THE RATE OF ROTATION OF FAST RUNNING MACHINES

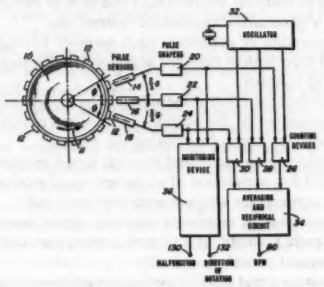
Klaus Kühnlein, Zirndorf, Fed. Rep. of Germany, assignor to AEG-Kanis Turbinenfabrik GmbH, Nuremberg, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 432,404
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1981, 3145162
Int. Cl.³ G01P *3/36*
U.S. Cl. 364—565 18 Claims

1. Apparatus for measuring and monitoring the angular velocity of the shaft of a rotating machine, comprising:

a plurality of sensors positioned adjacent the shaft of said rotating machine, each of said sensors generating sequential pulses having a period proportional to the angular velocity of said shaft, said pulses being generated at intervals such that, during the period between adjacent pulses from one sensor, pulses are generated by each of the others of said plurality of sensors;

an oscillator for generating reference pulses at a predetermined pulse repetition rate;



a plurality of counting devices coupled to respective ones of said plurality of sensors and to said oscillator, said counting devices counting the number of pulses generated by said sensors; and

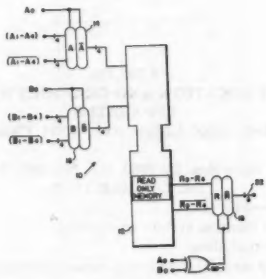
an averaging and reciprocal circuit coupled to the outputs of said counting devices for obtaining the average of the outputs of said counting devices and generating the reciprocal thereof, the output of said reciprocal circuit being proportional to the angular velocity of the shaft of said rotating machine in revolutions per unit time.

4,506,340

METHOD AND APPARATUS FOR PRODUCING THE RESIDUE OF THE PRODUCT OF TWO RESIDUES

Joseph C. Circello, Phoenix; Thomas H. Howell, Scottsdale, and Gregory C. Edgington, Glendale, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Apr. 4, 1983, Ser. No. 481,684
Int. Cl.³ G06F *7/72*
U.S. Cl. 364—746 11 Claims



1. Apparatus for producing the residue of the product of a multiplier and a multiplicand said multiplier and multiplicand also being residues, also being residues, all said residues being with respect to a check base m, where $m=2^{(b-1)}$, said residues being binary numbers of b bits each; comprising:

a memory device having a plurality of addressable memory locations, the address of each memory location having 2(b−1) bits, each of said addresses being divided into a first and a second component, each of (b−1) bits; the first

component being the lower order (b−1) bits, or their complements, of the multiplier and the second component being the lower order (b−1) bits, or their complements, of the multiplicand, bits of the residue of the product of the two components of the address being stored in a memory location having an address, the address of each location being that of the two components; said memory device in response to an address being applied to it during a read cycle producing signals representing the bits stored at the addressed location, where an address has 2(b−1) bits;

first circuit means for applying to the memory device a first component of the address; namely, the signals representing the lower order (b−1) bits of the multiplier if the signal representing the most significant bit of the multiplier is a logical zero and for applying the complements of the signals representing the lower order (b−1) bits of the multiplier if the signal representing the most significant bit of the multiplier is a logical one;

second circuit means for applying to the memory device the second component of the address; namely, the signals representing the lower order (b−1) bits of the multiplicand if the signal representing the most significant bit of the multiplicand is a logical zero, and for applying signals representing the complements of the lower order (b−1) bits of the multiplicand if the signal representing the most significant bit of the multiplicand is a logical one; and

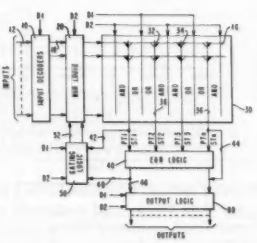
third circuit means to which are applied the signals produced by the memory device during a read cycle, said signals representing the b bits stored at the addressed location in the memory device, said third circuit means producing signals representing complements of the b bits stored at the addressed location of the memory device if and only if one of the most significant bits of the multiplicand and the multiplier is a logical one, otherwise said third circuit means producing signals representing the b bits stored at the addressed location.

4,506,341

INTERLACED PROGRAMMABLE LOGIC ARRAY HAVING SHARED ELEMENTS

Howard L. Kalter, Colchester, and Francis W. Wiedman, Stowe, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 10, 1982, Ser. No. 387,132
Int. Cl.³ G06F *7/50*
U.S. Cl. 364—786 **10 Claims**



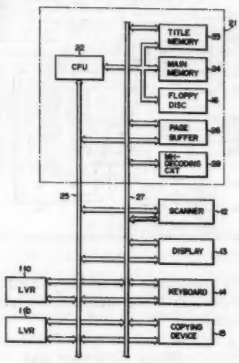
1. In a programmable logic array circuit including a first logic array responsive to first input signals for providing first output signals corresponding to the logical product terms of selected input signals during a first time interval and second logic array responsive to second input signals to provide during a second time interval output signals corresponding to sums of selected product terms provided by the first logic array, each logic array including a plurality of input lines and a plurality of output lines, the improvement characterized in that at least some of the input lines of both of the first and second logic arrays are physically common and at least some of the output lines of both the first and second logic arrays are physically common, said programmable logic array circuit including first logic means for providing logical representations of the logical product terms generated by the first logic array to the common input lines to generate a sum of product terms on the output lines during the second time interval.

4,506,342

DOCUMENT INFORMATION FILING SYSTEM

Kazuhiko Yamamoto, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 2, 1981, Ser. No. 317,423
Claims priority, application Japan, Nov. 5, 1980, 55-155473
Int. Cl.³ G06F *15/40*
U.S. Cl. 364—900 **8 Claims**



1. A document information filing system comprising:

means for calculating the remaining number of documents that may be stored on a recording medium from an address of index information in title information recorded on the recording medium, rated storage capacity of the recording medium and an average document information quantity of unit document information;

means for displaying the remaining storage capacity calculated by said calculating means;

document information producing means for producing document information corresponding to a pattern of a document through scanning thereof;

means for compressing the document information of said document information producing means;

recording and reproducing means for recording compressed document information from said compressing means on the recording medium and reading out the recorded compressed document information; and

means for decoding the compressed document information read out by said recording and reproducing means into the initial document information.

4,506,343

COLUMN LAYOUT REFERENCE AREA DISPLAY MANAGEMENT

Kenneth O. Shipp, Jr., Austin; Richard B. Wood, and James T. Repass, both of Round Rock, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 17, 1982, Ser. No. 379,163
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—900 **10 Claims**

1. A column reference area display management method for use in a word processing system including a keyboard, processor, memory and display, comprising the steps of:

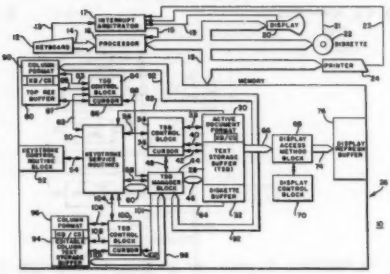
storing a multicolumn table to be displayed on said display in a first dedicated portion of said memory, said multicolumn table having a plurality of columns and rows;

generating commands via said keyboard for specifying a top reference area and side reference area of said display;

selecting column and row heading data via said keyboard for said top and side reference areas, respectively, of said display;

storing said selected column and row heading data in second and third dedicated portions of said memory, respectively;

displaying a first portion of said multicolumn table on an editable column viewport of said display, and displaying said column and row heading data in said top and side reference areas of said display, respectively;



generating commands via said keyboard for editing data in a second portion of the multicolumn table not presently on the display;

displaying said second portion of said multicolumn table in the editable column viewpoint; and

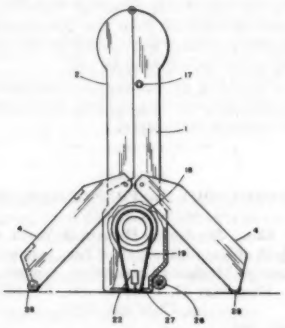
segmenting the top reference area and scrolling the side reference area by amounts proportional to the location of said data in the second portion of the multicolumn table displayed in the editable column viewport, whereby proper column and row heading data is continually displayed on said display.

4,506,344

HAND HELD ELECTRONIC POSTAGE METER HAVING SECURE POSTAGE METER DOORS

David W. Hubbard, Stamford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 4, 1982, Ser. No. 384,852
Int. Cl.³ G07B *17/04*
U.S. Cl. 364—900 **11 Claims**



1. In a postage meter of the type having means for printing postage and accounting means operatively coupled to the postage printing means for accounting for postage printed by said printing means, the improvement comprising:

a secure housing for enclosing said postage printing means and said accounting means, said secure housing having first and second housing members movable in between a first position wherein said postage printing means is exposed and a second position where said postage printing means is enclosed;

actuating means coupled to said housing first member and said housing second member, said actuating means operable to move said housing first and second members between first position where said printing means is exposed and said second position where said printing means is enclosed;

said actuating means having a locking means for preventing said actuating means from being operable to move said housing first and second members from said second position where said printing means is enclosed to said first position where said printing means is exposed unless the postage funds available for printing in said accounting means is at least equal to the amount of postage to be printed by said printing means; and

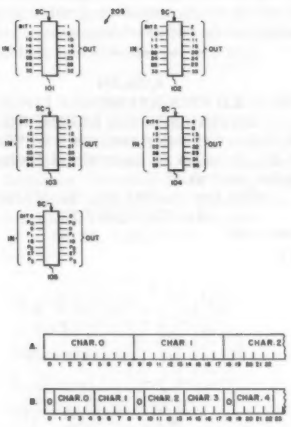
tamper detecting means coupled to said accounting means for canceling remaining postage in said postage meter if an attempt is made to force open said secure housing.

4,506,345

DATA ALIGNMENT CIRCUIT

Donald C. Boothroyd, Phoenix, and Robert W. Norman, Jr., Glendale, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jul. 2, 1982, Ser. No. 394,951
Int. Cl.³ G06F *15/00, 13/00*
U.S. Cl. 364—900 **4 Claims**



1. In a computer system, which includes a memory for storing at least one data block, said computer system having a plurality of predefined computer words including data words having a plurality of data formats, each data format having a predetermined number of characters within the data word, and each data format having a common character boundary, an alignment network for aligning said data words comprising:

(a) shift network means, having a first set of input terminals, a second set of input terminals, and a set of output terminals, for operatively connecting selected ones of said first and second set of input terminals to said output terminals in response to a shift control signal, said shift network means including

n shifters, each shifter having a first grouping of m input terminals, a second grouping of m-1 input terminals, and m output terminals, the m input terminals of all n shifters comprising the first set of input terminals of said shift network means, the m-1 input terminals of all n

shifters comprising the second set of input terminals of said shift network means, and the m output terminals of all n shifters comprising the set of output terminals of said shift network means, the first grouping of m input terminals of each shifter adapted to receive corresponding bits of each character in consecutive character order of a first predetermined data word format having the largest number of characters, the second grouping of m-1 input terminals of each shifter adapted to receive corresponding bits of each character in consecutive character order of said first predetermined data word format excluding the corresponding low order bit of each character, and the m output terminals corresponding to the first grouping of the m input terminals such that when the shift count control signal has a value of zero, the data bit applied to the first grouping of m input terminals are coupled unaltered to the m output terminals,

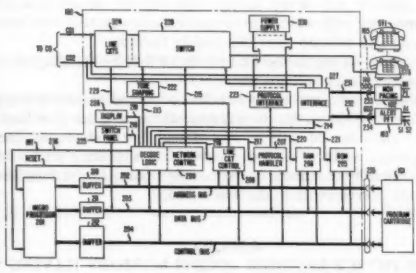
n having a value equal to the smallest number of bits utilized to define a single character of said first predetermined data word format, m having a value equal to the number of characters contained in said first predetermined data word format, and said shift count control signal having a value equal to the ratio of the number of characters within the common character boundary of the data word to be shifted to the number of characters within the common character boundary of the first predetermined data word format, multiplied by the number of character locations desired to be shifted.

4,506,346

PROGRAMMABLE CARTRIDGE TELEPHONE COMMUNICATION SYSTEM

Joseph M. Bennett, Middletown; Alan M. Gordon, Matawan; Vincent J. Silverio, Middletown, and Herbert M. Zydney, Rumson, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 1, 1982, Ser. No. 445,982
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **15 Claims**



1. A control module for connecting to a plurality of communication lines comprising:

a processor including memory means for controlling communications between said communication lines wherein

said memory means includes two or more memory sections each section being separately controlled by an enable signal,

cartridge receptor means connected to said processor to supplement the memory in said processor whenever a cartridge is inserted and

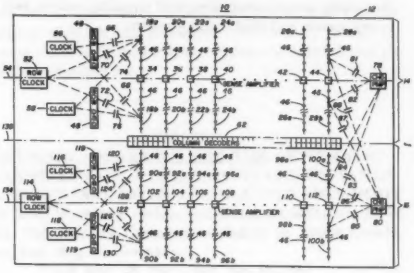
means responsive to the connection of a cartridge to said cartridge receptor means for disabling an enable signal to a first memory section.

4,506,347

PLACEMENT OF CLOCK CIRCUITS FOR SEMICONDUCTOR MEMORY

Robert J. Proebsting, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Feb. 20, 1981, Ser. No. 236,239
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—51 **14 Claims**



1. A placement of circuit components on a semiconductor substrate to form a portion of an integrated circuit memory which has a plurality of memory cells, comprising:

a plurality of bit lines coupled to said memory cells, fabricated on said substrate and organized into pairs within groups;

a sense amplifier coupled to each of said pairs of bit lines for reading one of said memory cells by sensing a voltage differential between the bit lines of one of said pairs connected thereto; and

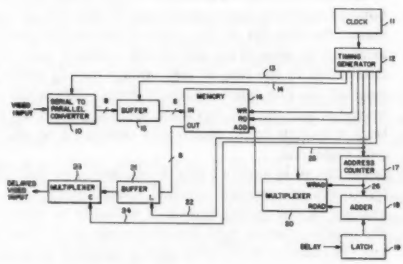
a circuit which generates transient signals at or immediately before a time said sense amplifiers sense the voltages on the bit lines connected thereto, said circuit located on said substrate such that a parasitic capacitive coupling from said circuit to a first bit line of a pair of said bit lines is essentially equal to a parasitic capacitive coupling to the second bit line in the pair of bit lines.

4,506,348

VARIABLE DIGITAL DELAY CIRCUIT

Ronald P. Miller, Shipshewana; William H. Chiles, and Bill L. Masteller, both of Mishawaka, all of Ind., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 14, 1982, Ser. No. 388,057
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—73 **10 Claims**



1. A variable digital delay circuit comprising:

timing means including timing signal generation means;

means for periodically sampling a signal to be delayed by a predetermined period of time;

memory means for storing each signal sample taken by said sampling means following taking the sample; and

means for reading a previously stored signal sample out of said memory means immediately following storing a signal sample therein, each signal sample being read out of said memory means having been stored therein a selected period of time determined by the timing signal generation means before being read out, the selected period of time corresponding to said predetermined period of time;

the timing means controlling said sampling means, said memory means and said reading means.

4,506,349

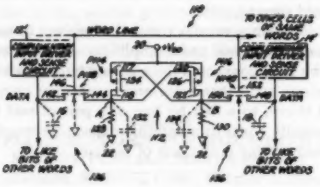
CROSS-COUPLED TRANSISTOR MEMORY CELL FOR MOS RANDOM ACCESS MEMORY OF REDUCED POWER DISSIPATION

Moshe Mazin, and William E. Engeler, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,689

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—189 **19 Claims**



1. A binary memory cell for connection to first and second complementary data input/output lines and to a word line carrying cell-enabling signals, said memory cell comprising:

a pair of voltage supply nodes;

first and second complementary data input/output nodes;

a latch including a pair of insulated-gate field-effect transistors of one channel conductivity type, the channel of one of said latch transistors arranged to selectively electrically connect said first data node to one of said voltage supply nodes, the channel of the other of said latch transistors arranged to selectively electrically connect said second data mode to the one of said voltage supply nodes, the gate of the one latch transistor being electrically connected to said second data node, and the gate of the other latch transistor being electrically connected to said first data node; and

a gating circuit including a pair of insulated-gate field-effect transistors of opposite channel conductivity type, the channel of one gating transistor arranged to selectively electrically connect said first data node to the first data line, the channel of the other gating transistor arranged to selectively electrically connect said second data node to the second data line, and the gates of said gating transistors arranged for connection to the word line for controlling conduction through the channels of said gating transistors.

4,506,350

NON-VOLATILE SEMICONDUCTOR MEMORY SYSTEM

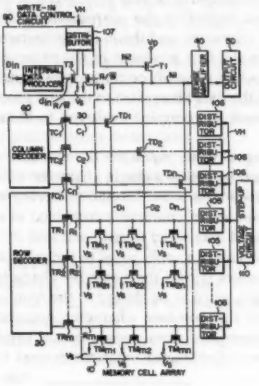
Masamichi Asano, Tokyo, and Hiroshi Iwahashi, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 1, 1982, Ser. No. 353,515

Claims priority, application Japan, Mar. 3, 1981, 56-30210; Apr. 17, 1981, 56-57900; Jun. 3, 1981, 56-85466

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—191 **13 Claims**



1. A non-volatile semiconductor memory system comprising:

a row decoder;

a column decoder;

a plurality of row lines selected by said row decoder and constituting a first line group;

a plurality of column lines;

a plurality of column selection lines selected by said column decoder and constituting a second line group, said column selection lines being coupled to said column lines in such a way that a selected column selection line selects the corresponding column line;

a memory cell array having non-volatile semiconductor memory cells which are connected between said row lines and said column lines in a matrix fashion;

voltage boosting means for boosting a first level voltage to a second level voltage; and

a plurality of distributing circuits connected to said voltage boosting means for distributing said second level voltage to each line of at least one of said first and second line groups, each of said distributing circuits supplying said second level voltage to the corresponding line only when said corresponding line is selected.

4,506,351

ONE-DEVICE RANDOM ACCESS MEMORY HAVING ENHANCED SENSE SIGNAL

Roy E. Scheuerlein, Burlington, Vt., and Seiki Ogura, Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,333

Int. Cl.³ G11C *7/00, 11/24, 11/40*

U.S. Cl. 365—205 **19 Claims**

1. A memory comprising:

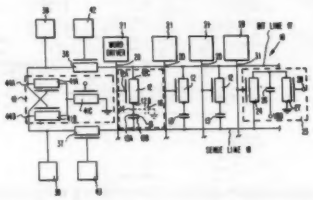
an array of memory cells arranged in a plurality of rows and a plurality of columns, each memory cell comprising a transistor having a controlling electrode and first and second controlled electrodes, and a charge storage device having first and second plates, said first plate being connected to said first controlled electrode;

a plurality of word lines, a respective one of which is connected to the controlling electrode of each one of all of the memory cells in a respective column;

a plurality of bit lines, a respective one of which is connected to the second controlled electrode of each one of all of the memory cells in a respective row;

a plurality of sense lines, a respective one of which is connected to the second plate of each one of all of the memory cells in a respective row;

a plurality of differential sensing means having first and second inputs, the first input of a respective one of said differential sensing means being coupled to a respective one of said bit lines and the second input of the respective one of said differential sensing means being coupled to a respective one of said sense lines to which the memory cells in a row are connected;



means, connected to said word lines, for activating the transistors in a selected column to thereby transfer the charge on the charge storage devices in said selected column onto said bit lines and said sense lines, and onto said first and second inputs;

first means for electrically connecting said first inputs to said bit lines subsequent to the transfer of charge to said first inputs; and,

second means for electrically disconnecting said second inputs from said sense lines subsequent to the transfer of charge to said second inputs, said first and second means being controlled independently of each other to thereby transfer charge from said first inputs back to the charge storage devices in said selected column, and to thereby prevent the disturbing of charge storage devices in an unselected column.

4,506,352

METHOD FOR USE IN MARINE SEISMIC DATA GATHERING

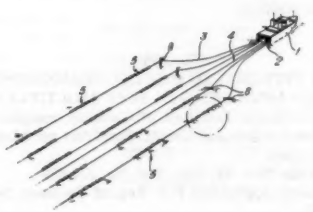
Helge Brandsaeter, Oslo, and Olav Eimstad, Asker, both of Norway, assignors to Geophysical Company of Norway A/S, Hovik, Norway

Filed Nov. 3, 1981, Ser. No. 317,880

Claims priority, application Norway, Nov. 12, 1980, 803400

Int. Cl.³ G01V *1/38*

U.S. Cl. 367—21 **7 Claims**



7. In a method for use in marine seismic surveys for obtaining measurement data from subterranean formations, in which a plurality of transmitters of seismic signals and an acoustic cable are towed behind a vessel, wherein the transmitters are deployed in the water in arrays for the formation of point-source-formed subarrays, the improvement comprising controlling the emitted power and the firing timing of the seismic signals from the vessel in accordance with data collected previously regarding the nature of the sea bed and/or the subterranean formation, and varying the frequency of the seismic signals generated by the subarrays in accordance with the depth, thickness and/or configuration of the subterranean formation and in accordance with the propagation rate of the sound waves through the formation structure by firing the subarrays at different points in time, so that the emitted energy is focused to a limited area.

4,506,353

MEASURING APPARATUS FOR THE AUTOMATIC MEASUREMENT OF SPEED, TRAVELLED DISTANCE AND DIRECTIONAL CHANGES OF A MOVABLE BODY

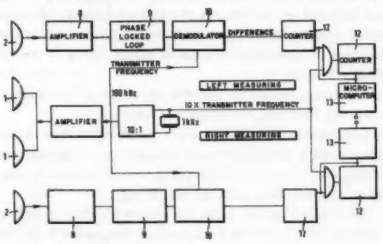
Joachim Rott; Wolfgang Thelen, and Bernd Hesselbrock, all of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 382,917

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1981, 3122963

Int. Cl.³ G01S *15/60*

U.S. Cl. 367—91 **7 Claims**



1. Measuring apparatus for automatic measurement of speed, distance travelled and directional changes of a moving vehicle traveling over the ground by means of ultrasonic wave Doppler shifts, said apparatus comprising:

a first measuring unit mounted on the vehicle adjacent one side thereof and directed generally downwardly toward the ground;

a second measuring unit laterally spaced from said first measuring unit and mounted on the vehicle adjacent the opposite side thereof and directed generally downwardly toward the ground;

a first transmitter in said first measuring unit;

a first receiver in said first measuring unit;

a second transmitter in said second measuring unit;

a second receiver in said second measuring unit;

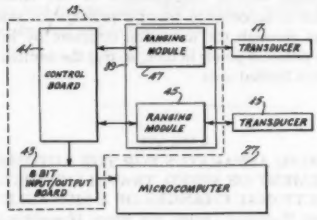
said first and second transmitters being arranged with respect to the vehicle to transmit the ultrasonic beams to the ground parallel to a vertical plane through the longitudinal axis of the vehicle and at an angle of $90°-\alpha$ with respect to the vertical, said transmitted beams being reflected from the ground and received by said first and second receivers, the Doppler shift of the received signals providing indications of the speed of and distance travelled by the vehicle; and

means for determining the difference of the measured speed and distance values between said first and second measuring units thereby indicating the directional deviation of the vehicle relative to the ground.

4,506,354
ULTRASONIC POSITION DETECTING SYSTEM

Per K. Hansen, Burlington, Vt., assignor to Position Orientation Systems, Ltd., Burlington, Vt.

Filed Sep. 30, 1982, Ser. No. 429,856
Int. Cl.[3] G01S 15/04
U.S. Cl. 367—101 26 Claims



1. An apparatus for determining the position of any of a variety of objects in a preferred region of a plane comprised of:

(a) first and second means, each said means transmitting and receiving ultrasonic pulses;

(b) an ultrasonic driving means providing driving power to said first and second means in a series of pulses, the driving means driving said first and second means at a plurality of different frequencies and each pulse being a monofrequency output;

(c) a receiving means to receive an echo of a sound pulse from said first and/or second means;

(d) a discriminator means to elect preferred echos in accordance with a time delay and magnitude of signals representing the echos received from said first and/or second means, the election criteria including

(i) the elected echos must be received after a first time period in which said means has transmitted an ultrasonic pulse and blanking of said means during a blanking period has occurred, said first and second means being separated by more than twice a distance determined by multiplying half of said first time period with the speed of sound;

(ii) when the apparatus is operated whereby one of said means transmits and the other of said means receives, the elected echos must be received within a second time period determined by the greatest distance from one of said means to the furthest part of said preferred region of said plane and back to the other of said means as divided by the speed of sound;

(iii) when the apparatus is operated whereby one of said means both transmits and receives said pulses, the elected echos must be received within a third time period determined by twice the shortest distance from said one of said means to the preferred region of said plane divided by the speed of sound;

(e) a time-measuring means to measure the time delay between each transmitted pulse and each elected echo;

(f) a means to determine a location of the source of the elected echos by deriving information from the measured time delays;

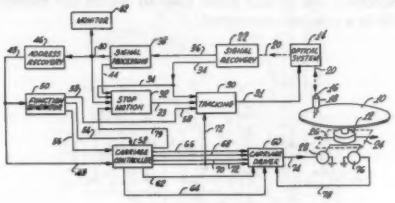
(g) a computing module means including a microprocessor to (i) generate signals controlling said first and second means and (ii) calculate said positon; and

(h) a computer interface means to provide a signal representative of the location of the source of the echos to a computer.

4,506,355
METHOD AND APPARATUS FOR INFORMATION RETRIEVAL FROM AN OPTICALLY READABLE STORAGE MEDIUM

Wayne R. Dakin, Redondo Beach, and Ludwig Ceshkovsky, Fountain Valley, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Continuation of Ser. No. 295,629, Aug. 24, 1981, , which is a continuation of Ser. No. 920,777, Jun. 30, 1978, abandoned. This application Dec. 13, 1982, Ser. No. 449,061
The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.
Int. Cl.[3] G11B 7/00, 17/00
U.S. Cl. 369—32 7 Claims



1. In an apparatus for selectively retrieving information from a plurality of optically readable information tracks formed in an information storage medium, wherein the information includes location identification data identifying the location of different segments of said information, said apparatus further including means for impinging an incident beam of radiation upon the storage medium, and information recovery means for recovering information from a modulated beam of radiation produced thereby, the combination comprising:

carriage means for moving the storage medium and the incident beam of radiation relative to one another to cause the incident beam to move across said tracks in a search mode of operation and in a direction toward a predetermined position on said storage medium;

carriage driver means for producing a drive signal to be applied to said carriage means to effect said relative movement of said incident beam in said direction in said search mode of operation,

said means for recovering information including means for detecting location identification data from the recovered information, and intermittently redetermining the incident beam position, from location identification data in the information recorded, during said relative movement of said incident beam across said tracks in said search mode and in said direction toward said predetermined position; and

control means, operating after said incident beam has been moved to within a prescribed distance from said predetermined position, for controlling said carriage driver means to alter said drive signal and thereby cause said carriage means to progressively slow and then cease its search mode movement when said incident beam is at said predetermined position.

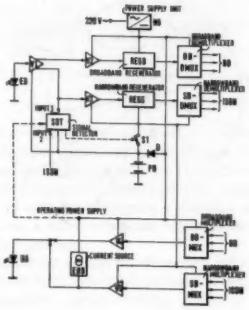
4,506,356
SERVICE INTEGRATED DIGITAL TRANSMISSION SYSTEM OPERATING IN TIME MULTIPLEX

Klaus Krull, Weissach, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 24, 1981, Ser. No. 324,659
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044702
Int. Cl.[3] H04B 9/00
U.S. Cl. 370—1 5 Claims

1. In a terminal device for use in a service integrated, multi-

plex digital signal transmission system which includes an optical fiber waveguide line connected to the terminal device for conducting a light signal and means for modulating the light signal with multiplexed narrowband signals and multiplexed broadband signals, the terminal device including narrowband signal processing means connected to the optical fiber waveguide line for transforming only narrowband signals between a multiplexed state and a demultiplexed state, broadband signal processing means connected to the optical fiber waveguide line for transforming only broadband signals between a multiplexed state and a demultiplexed state, means connected for normally supplying operating power to said broadband and



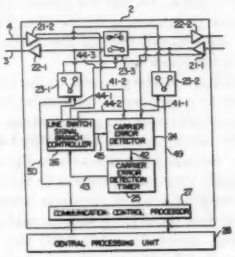
narrowband signal processing means from local utility mains, a charge accumulator for supplying operating power in the event of interruption of the power supply by the local mains, and switching means connected to the accumulator and narrow band signal processing means for supplying operating power to said narrowband signal processing means from said charge accumulator to effect signal transmission at a reduced bit rate in the event of such local power interruption, the improvement comprising signal detector means for monitoring if narrowband signals are transmitted or not and connected to said switching means for causing operating power to be supplied from said accumulator for signal processing only during times when signal transmission is taking place.

4,506,357

METHOD AND APPARATUS FOR SWITCHING LOOP TYPE TRANSMISSION LINES

Susumu Nakayashiki, Yokohama; Masahiko Kida, Hadano, and Toyokazu Hashimoto, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 19, 1982, Ser. No. 359,709
Claims priority, application Japan, Mar. 25, 1981, 56-42321
Int. Cl.³ H04J *3/14*
U.S. Cl. 370—16 **6 Claims**



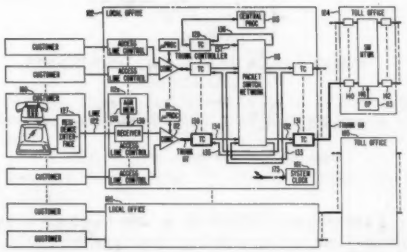
1. A method of switching loop type transmission lines for a transmission control system wherein a plurality of stations are linked by a transmission path including active and stand-by loop type transmission lines and wherein each station is normally connected to said active transmission line and a first station includes means for transmitting a carrier wave over at least said active one of said loop type transmission lines, the method comprising the steps of, in each of said terminal stations receiving said carrier wave from at least said active one of said transmission lines, detecting an abnormality in said carrier wave received through said active transmission line, re-transmitting said received carrier wave on said active transmission line when no abnormality is detected therein, switching the connection of the station to the transmission path from said active line to said stand-by line in response to the detection of an abnormality in said carrier wave, and in said first station, halting the transmission of said carrier wave on said active line in response to said detection of an abnormality so that occurrence of a fault in the active transmission line will result in all stations switching the connection of the station to the stand-by transmission line.

4,506,358

TIME STAMPING FOR A PACKET SWITCHING SYSTEM

Warren A. Montgomery, DeKalb, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 25, 1982, Ser. No. 392,377
Int. Cl.³ H04J *6/00*
U.S. Cl. 370—60 **38 Claims**



1. A system for communicating packets each comprising a time delay field for accumulating delay encountered by each of said packets, comprising:

a plurality of transmission means;

a switching network interconnecting said plurality of transmission means;

said switching network comprises:

concatenating means responsive to the receipt of one of said packets from one of said transmission means to concatenate signals representing arrival time with said one of said packets;

routing means for transferring the concatenated signals and said one of said packets through said network;

means for calculating signals representing an amount of time delay resulting from the routing of said concatenated signals and said one of said packets by determining signals representing the difference between said signals representing said arrival time and signals representing present time; and

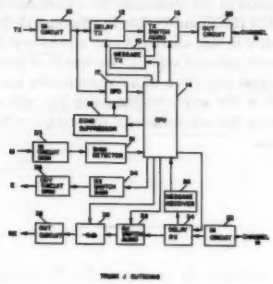
means responsive to said difference signals to add said difference signals into said time delay field of said one of said packets.

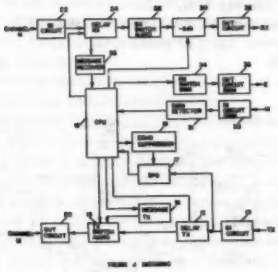
4,506,359

TASI APPARATUS FOR USE WITH SYSTEMS HAVING INTERREGISTER MULTIFREQUENCY SIGNALLING

Teodor Henquin, Kiron, and Ya'acov B. Zeev, Ramat Gan, both of Israel, assignors to Electronics Corporation of Israel Ltd., Tel Aviv, Israel

Filed Aug. 23, 1982, Ser. No. 410,596
Claims priority, application Israel, Sep. 1, 1981, 63707
Int. Cl.³ H04J 3/16
U.S. Cl. 370—81 15 Claims





1. TASI apparatus suitable for use with telephone networks employing interregister multifrequency signalling comprising:

transmission apparatus at a first end of a transmission trunk link having a first plurality of communication channels, said transmission apparatus including means for detecting signals on a second plurality of telephone communication lines and for assigning each telephone communication line on which signals are present to an available one of the first plurality of communication channels and means for applying a delay to the detected signal;

receiving apparatus at a second end of said transmission link including means for assigning each of said first plurality of communication channels carrying signals to a corresponding one of the second plurality of telephone communication lines in accordance with assignment information received from said transmission apparatus;

means for communicating messages including assignment information between said transmission apparatus and said receiving apparatus;

means for sensing the onset of interregister multifrequency signalling on said second plurality of telephone communication lines; and

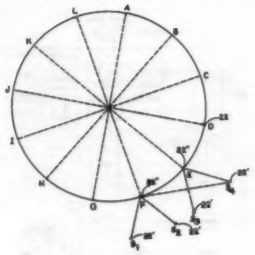
means for disabling said means for applying a delay to the detected signals in response to the sensed onset of interregister multifrequency signalling.

4,506,360

MULTI-STATION TOKEN PASS COMMUNICATION SYSTEM AND METHOD

J. Michael Kryskow, Jr., Hudson, N.H., and Allan Tanzman, Cambridge, Mass., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 29, 1982, Ser. No. 363,090
Int. Cl.³ H04J 6/00
U.S. Cl. 370—85 52 Claims



1. An improved method of communicating over a communication medium by a plurality of stations interconnected to the medium, each station having an address identified by a series of ON-OFF type bits, the method of the type wherein each station which has access to the medium has means for transmitting information to other stations and, if desired, to command other stations to transmit information, each station with such access to the medium knowing from whom it receives the token (its FROM station) as well as to whom it next passes the token (its TO station), and wherein each such station having access to the medium being part of a token list comprising all such stations having such access to the medium, each station in the token list passing access to the medium (called a token) to its TO station; and wherein each station's FROM and TO stations have addresses respectively lower and higher than said station's address unless the station is the then lowest addressed station in the token list, in which case its FROM station is the highest addressed station in the token list, or unless the station is the then highest addressed station in the token list, in which case its TO station is the lowest addressed station in the token list; wherein the improvement comprises an improved demanding mechanism for allowing other stations to obtain access to the medium, comprising the steps of:

(1) Providing one and only one station in a token list able to generate a signal (Demander Enable signal) during a period of time (a demand window) after receipt of the token so that stations not part of the token list may demand access to the token list;

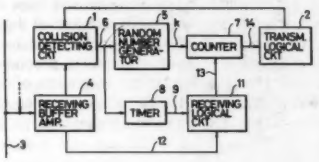
(2) each station requiring access to the medium waiting for the token to pass over its address so that the demanding station can determine from the address of the station that passed the token over its address its FROM and TO stations for use when it has access to the medium; and

(3) each singly responding station to the Demander Enable signal receiving a signal (demand token) sent by the demand window generating station; said signal causing the demanding station to patch itself into the token list by informing its FROM and TO stations that it is in the token list, and wherein said activity by the demanding station causes the demand window generating station to continue its use of the medium and to pass the token to its TO station.

4,506,361
RETRANSMISSION CONTROL SYSTEM

Hiroshi Kume, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1983, Ser. No. 513,586
Claims priority, application Japan, Jul. 14, 1982, 57/121230
Int. Cl.³ H04J 6/00
U.S. Cl. 370—85 5 Claims



1. In a multi-station communication network in which a plurality of stations connected through taps to a communication cable transmit digital signals multiplexed in a time division manner to thereby transmit signals in time channels, a retransmission control system comprising a plurality of retransmission control circuits, a control circuit being associated with each station and comprising:

collision detecting means for detecting when at least two of said stations simultaneously transmit digital signals to said communication cable causing collision of said digital signals;

waiting time setting means for stopping transmission of the digital signal generated by the station associated with the control circuit when a collision is detected, and for initiating a waiting time before retransmitting said signal; and

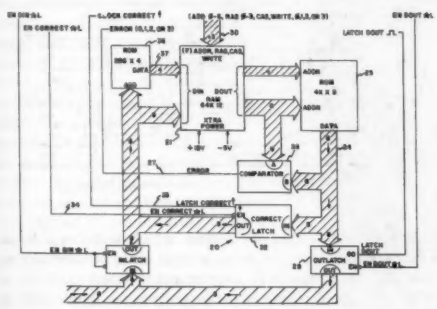
waiting time adjusting means for increasing said waiting time when said communication cable is used by another station during said waiting time,

whereby the retransmission interval of said digital signal is controlled according to the degree of congestion of the digital signals transmitted over said communication cable.

4,506,362
SYSTEMATIC MEMORY ERROR DETECTION AND CORRECTION APPARATUS AND METHOD

Richard E. Morley, Mason, N.H., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 972,440, Dec. 22, 1978, abandoned.
This application Jul. 26, 1982, Ser. No. 401,974
Int. Cl.³ G06F 11/10; G11C 29/00
U.S. Cl. 371—13 39 Claims



1. For use in a digital computer system comprising a data memory and at least one data user, a memory system for storing and retrieving data for the data user comprising:

A. means for storing W words of original N bits of data in W words of N+M flip-flops to provide for error correction, such that a change in one of the N+M flip-flops in only one of the W words does not prevent the retrieval of the original N bits stored in that word, and wherein W, N and M are positive integers, W being very much greater than N and M;

B. means connected to said storing means to retrieve therefrom for a data user the original N bits stored in any word of the W words in spite of an error in one of the N+M flipflops in that word;

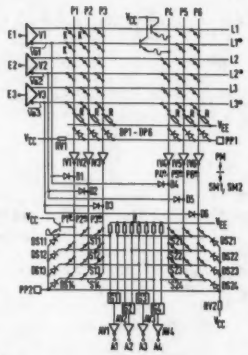
c. means connected to said storing means and said retrieval means to purge from said storing means an error in a single flip-flop of one of the W words by causing said retrieval means to retrieve the original N bit word stored in the N+M flip-flops, such that if an error was present in one of the flip-flops before the purge it is corrected and will not be present after the purge;

D. means connected to said storing means and said purge means causing the above word level purge operation to be repeatedly performed once, on every one of the W words in turn, and at times when no data is being requested by the data users, such that the entire system of W words is purged of single bit errors at a frequency of 1/T seconds, such that no flip-flop in the system remains in an incorrect state for more than T seconds, and such that the chance of a flip-flop becoming incorrect while one of the other N+M−1 bits in the same word is incorrect, forming an uncorrectable double bit error, is a function of the time T rather than the time X between accesses to each word by the data users; the time T being very small compared to the time X normally used in reliability calculations such that the ratio T/X, the chance of an uncorrectable double bit error in the claimed system to the chance of an uncorrectable double bit error in a conventional error detection and correction system, is very small, at least X/T times as reliable as conventional error detection and correction systems.

4,506,363
PROGRAMMABLE LOGIC ARRAY IN ECL TECHNOLOGY

Claude Barre, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,442
Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220302
Int. Cl.³ G01R 31/28
U.S. Cl. 371—15 3 Claims



1. In a programmable logic array of the type which includes a product matrix and a sum matrix, in which a plurality of input amplifiers each include an input for receiving binary input

signals and inverting and non-inverting outputs connected to respective product matrix input lines, in which a plurality of product term lines intersect the product matrix input lines and are coupled thereto by non-inverting coupling elements over programmable disconnectible connections and are terminated by respective product term inverters, in which a plurality of sum matrix input lines are respectively connected to the outputs of the product term inverters in which a plurality of sum term lines intersect the sum matrix input lines and are coupled thereto by non-inverting elements over programmable disconnectible connections and are connected to respective output amplifiers of the programmable logic array, the improvement therein comprising:

a first test terminal for receiving a predetermined test potential;

a plurality of first diodes each including an anode connected to said first test terminal and a cathode connected to a respective product term line;

said sum matrix divided into submatrices each including divided sum term line sections, corresponding in each sub-matrix, and, at most, as many sum matrix input lines as there are input amplifiers;

a plurality of logic circuits each including an output connected to the input of a respective output amplifier and a plurality of inputs connected to corresponding sum term line sections;

a plurality of second diodes each including an anode connected to the inverting output of a respective input amplifier and a cathode connected to a respective sum input line such that each of the sum matrix input lines is so connected and is also connected to only one respective input amplifier;

a second test terminal for receiving a predetermined test potential; and

a plurality of third diodes each including a cathode connected to a respective sum term line section and an anode connected to said second test terminal.

4,506,364

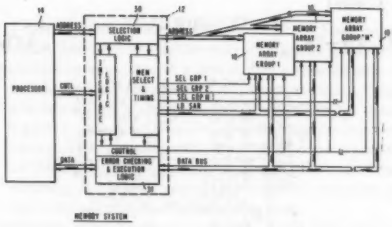
MEMORY ADDRESS PERMUTATION APPARATUS

Frederick J. Aichelmann, Jr., Hopewell Junction, and Lawrence K. Lange, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,644

Int. Cl.[3] G06F *11/10*; G11C *29/00*

U.S. Cl. 371—38 **6 Claims**



1. In a memory system with memory space arranged in logical data words with bit positions of any of the logical data words stored in a plurality of memory elements where the memory elements are each accessed through a different one of a plurality of decoders by an actual address of a data location in the element, new apparatus for preventing faulty data bits at the same actual address in two different memory elements from being used to store different bit positions of a given logical data word comprising:

address means for providing a logical address for said given logical data word;

a single address translation means for translating said logical address to all actual addresses of data bits accessed by each of said plurality of decoders, said translation means including permutation means for substituting address bits of said logical address with address bits of another logical address in the memory space in the translating of the logical address to the actual address for one of said two different memory elements so that the actual address for bit position of the logical data word stored in said one of said two different memory elements differs both from the actual address for the bit position stored in the other of said two different memory elements and from the actual address of other bit positions in said logical data word;

distribution means for supplying to each of said decoders the appropriate one of said actual addresses produced by said translation means whereby the alignment of the faulty data bits in said given logical address can be eliminated without the use of spare memory elements.

4,506,365

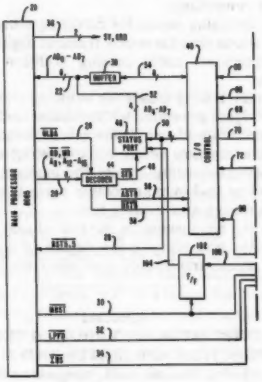
ERROR CORRECTION SYSTEM

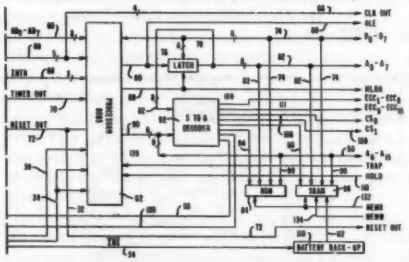
Donald A. Collins, Easley, S.C., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 22, 1982, Ser. No. 443,835

Int. Cl.[3] G06F *11/10*

U.S. Cl. 371—38 **4 Claims**





1. In a computer memory system which includes a large dynamic random access memory, a small static random access memory, a multi-stage shift register constructed to divide a multi-bit data word stored in the large dynamic memory by a polynomial to generate a first error correction code for storage in the small static memory when the data word is stored in the large memory and a second error correction code when the same data word is read from the large memory and processing means for comparing the first and second error correction

code to detect the presence of an error bit in the data word, a method for correcting an error in a multi-bit data word comprising the steps of:

shifting the first error correction code from the small static random access memory into the multi-stage shift register;

shifting a plurality of zero bits into the shift register;

counting the number of zero bits shifted into the shift register;

sensing the output of each of the stages of the shift register as each zero bit is shifted into the shift register;

generating a first signal indicating the detection of a single bit correctable error when the last stage of the shift register outputs a first binary signal and the remaining stages of the shift register each outputs a second binary signal, said first signal indicating the presence of an error bit in the data word whose location corresponds to the number of zeros shifted into the shift register at the time the first signal is generated; and

correcting the error bit in the data word by complementing the signal level of the error bit.

4,506,366

SEMICONDUCTOR LASER DEVICE

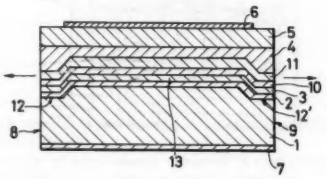
Naoki Chinone, Hachioji; Yasutoshi Kashiwada, Hinodemachi; Shigeo Yamashita, Machida, and Kunio Aiki, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1982, Ser. No. 393,313

Claims priority, application Japan, Jul. 3, 1981, 56-103344

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—45 **7 Claims**



1. A semiconductor laser device including at least a laminated layer region of first, second, third and fourth semiconductor layers on a predetermined semiconductor substrate, means forming a resonant cavity, and electrodes for injecting current into said device, wherein said second layer is an active layer; said third semiconductor layer has a refractive index smaller than that of said second semiconductor layer; said first and fourth semiconductor layers having a refractive index smaller that that of said second and third semiconductor layers; said first semiconductor layer has a conductivity type opposite that of said third and fourth semiconductor layers; the forbidden band gap of said first and third semiconductor layers is greater than that of said second semiconductor layer; and at least said second and third semiconductor layers are bent along lines parallel to and inwardly spaced from the laser light-emitting facets of said device, to such a degree that the laser light generated inside said second semiconductor layer, in the proximity of said laser light-emitting facets, is optically coupled to said third semiconductor layer and is emitted from the crystal facets of said third semiconductor layer, at least one of said electrodes having a width less than the width of said laminated layer regions such as to overlie substantially only that portion of said layer region between said lines where said second and third layers are bent.

4,506,367

DISTRIBUTED FEEDBACK SEMICONDUCTOR LASER

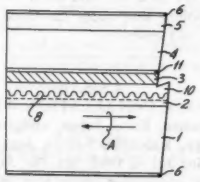
Shigeyuki Akiba; Kazuo Sakai, both of Tokyo; Katsuyuki Utaka, Musashino, and Yuichi Matsushima, Tokorozawa, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1982, Ser. No. 433,085

Claims priority, application Japan, Oct. 9, 1981, 56-160112

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—45 **1 Claim**



1. A distributed feedback semiconductor laser having an InP substrate, a multiplicity of semiconductor layers including an n-type InGaAsP layer formed on said substrate, an n-type InP layer and an InGaAsP light-emitting layer successively overlying the n-type InGaAsP layer, periodic corrugations disposed on a surface remote from the substrate between the n-type InP layer and said n-type InGaAsP layer and disposed to extend in the direction of travel of light, and electrodes to apply current to the laser.

4,506,368

DYE LASERS USING 2-(4-PYRIDYL)-5-ARYLOXAZOLES AND QUATERNARY SALTS OF THESE COMPOUNDS

Lester A. Lee, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 2, 1980, Ser. No. 155,248

Int. Cl.³ C07D *413/04;* H01S *3/20*

U.S. Cl. 372—53 **18 Claims**

1. 4-[2-(5-p-methoxyphenyloxazolyl)]pyridinium p-toluenesulfonate.

4,506,369

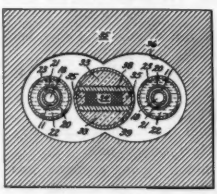
HIGH POWER CESIUM LAMP SYSTEM FOR LASER PUMPING

John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 6, 1982, Ser. No. 405,826

Int. Cl.³ H01S *3/092;* H01J *13/00*

U.S. Cl. 372—72 **14 Claims**



1. The lamp system for laser pumping comprising:

an evacuable arc tube having a first end and a second end;

a solid metal anode disposed in the first end of said arc tube;

a liquid cesium reservoir disposed in the second end of said arc tube;

a cathode comprising a conductive material capable of adsorbing cesium, said cathode protruding from said reser-

voir so as to provide a preferred discharge termination point;

a fill gas, including cesium vapor, disposed within said arc tube between said anode and said cathode;

an evacuable outer envelope surrounding said arc tube and disposed so that the surface of said arc tube and the surface of said outer envelope are spaced a fixed distance apart, said outer envelope and said arc tube being transmissive to infrared radiation;

a heat transfer gas disposed within said outer envelope between said arc tube and said outer envelope; and

means for cooling said outer envelope, said means being external to said envelope.

4,506,370

ARC FURNACE INSTALLATION WITH SHROUD

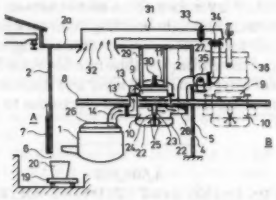
Yoshiaki Yoshimatsu, Kure, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Jul. 6, 1983, Ser. No. 511,175

Claims priority, application Japan, Feb. 28, 1983, 58-28734[U]

Int. Cl.³ F27D *7/00, 17/00*

U.S. Cl. 373—8 **7 Claims**



1. An arc furnace installation with a shroud, wherein said arc furnace is air-tightly enclosed within said shroud; one side wall of said shroud is provided with a door through which a scrap heating chamber is horizontally moved into or out of said shroud; and a means is provided for bringing said scrap heating chamber to a first position immediately above said arc furnace, said means being also operable to selectively bring said scrap heating chamber to a scrap preheating position within said shroud but spaced away from said arc furnace by a predetermined distance and a scrap charging position outside of said shroud, whereby scraps are charged into said scrap preheating chamber at said scrap charging position and preheated at said scrap preheating position and then charged into said arc furnace at said first position.

4,506,371

UNDERWATER THERMOMETER AND METHOD OF MAKING

Gregory L. Cross, and Wendell C. Cross, both of 11413 W. 48th Ave., Wheatridge, Colo. 80033

Filed May 5, 1983, Ser. No. 491,895

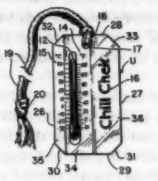
Int. Cl.³ G01K *1/14, 5/08;* **B32B** *31/12;* **B65D** *85/38*

U.S. Cl. 374—136 **16 Claims**

1. An underwater thermometer capable of use to depths on the order of 150 feet, comprising:

a transparent block having a planar rear surface provided with a longitudinal recess adapted to receive a fluid and tube type temperature indicator and a front surface through at least a portion of which said temperature indicator is visible;

a transparent layer having a front surface adhesively secured to said planar rear surface of said block and adhesively securing said indicator in a position on said front surface so as to be within said recess of said block, said transparent layer having temperature measurement indicia correlated with said indicator printed in reverse on a rear surface of said transparent layer; and



an opaque layer adhesively secured to said rear surface of said transparent layer.

4,506,372

METHOD AND APPARATUS FOR RECOGNIZING IN A RECEIVER THE START OF A TELEGRAM SIGNAL CONSISTING OF A BIT IMPULSE SEQUENCE

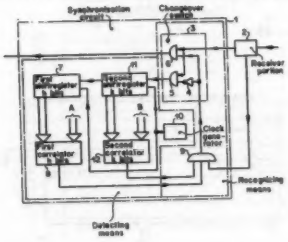
James L. Massey, Zurich, and Thomas Schaub, Thalwil, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG., Zug, Switzerland

Filed Nov. 9, 1982, Ser. No. 440,190

Claims priority, application Switzerland, Nov. 11, 1981, 7251/81

Int. Cl.³ H04L *7/00*

U.S. Cl. 375—116 **13 Claims**



1. In a method of recognizing the start of a noise-corrupted received telegram signal, said telegram signal consisting of an information-containing sequence of bits,

the steps comprising

transmitting a preliminary sequence of m bits ahead of the telegram signal,

thereafter transmitting an intermediate sequence of k bits following said preliminary sequence, but still ahead of the telegram signal, said preliminary and intermediate sequences being correlated with different parts of said preliminary and intermediate sequences in a prearranged manner, wherein said intermediate sequence consists of k bits, wherein j denotes a number 1, 2 . . . k, and wherein the correlation-establishing step includes minimizing the correlation between

the last k bits of said preliminary sequence and of said intermediate sequence,

the first 2j bits of said intermediate sequence and the last 2j bits of said preliminary sequence for values of the number $j=1, 2 \ldots, (k/2)-1$, k is even, and

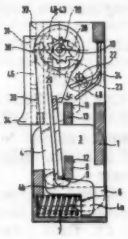
the first $(2j-1)$ bits of said intermediate sequence with the last $(2j-1)$ bits of said intermediate sequence, for values of the number $j=1, 2 \ldots (k/2-0.5)$ when k is uneven, and

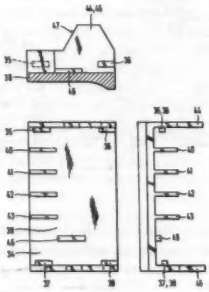
detecting said pre-arranged manner so as to positively signal termination of said intermediate sequence, whereby recognition of the start of said telegram signal is ensured.

4,506,373
RESETTABLE MECHANICAL COUNTER

Kurt Kratt, Aldingen, Fed. Rep. of Germany, assignor to J. Hengstler K.G., Aldingen, Fed. Rep. of Germany

Filed Jan. 24, 1983, Ser. No. 460,398
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1982, 3203137
Int. Cl.³ G06M 1/28
U.S. Cl. 377—88 12 Claims



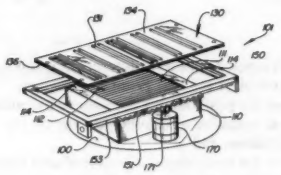


1. In a resettable mechanical counter comprising
a counter frame,
a plurality of digit wheels mounted in said frame for mutually independent rotation about a first axis,
a plurality of heart-shaped cams, each of which is non-rotatably connected to one of said digit wheels,
a pinion axle mounted in said frame and defining a second axis, which is spaced from and parallel to said first axis,
a plurality of carry pinions, each of which is adapted to mesh with two adjacent ones of said digit wheels, said carry pinions being mounted on said pinion axle for mutually independent rotation and being movable by said pinion axle into and out of mesh with said digit wheels,
spring means for urging said carry pinions toward said digit wheels, and
resetting means for moving said carry pinions out of mesh with said digit wheels and for holding said carry pinions out of mesh with said digit wheels and for engaging said heart-shaped cams so as to move said digit wheels to a predetermined position and for subsequently releasing said carry pinions for a movement into mesh with said digit wheels,
the improvement residing in that
said frame is formed with tracks which are accessible from the outside of said frame,
said resetting means comprise a resetting slider, which is engageable with said tracks from the outside of said frame and movable along said tracks to a predetermined end position,
said resetting slider carries disengaging cams arranged to engage said pinion axle and to move said carry pinions out of mesh with said digit wheels during an initial part of the movement of said slider along said tracks toward said end position, and to hold said carry pinions out of mesh with said digit wheels during a subsequent part of said movement, and to release said carry pinions for a movement into mesh with said digit wheels after said subsequent part of said movement of said slider has been completed,
said resetting slider carries resetting fingers arranged to engage said heart-shaped cams so as to reset said digit wheels to said predetermined position during said subsequent part of said movement of said slider, and to hold said digit wheels in said predetermined position until said disengaging cams have released said carry pinions, and
said slider when in said end position is removable from said frame without changing the positions of said digit wheels and said carry pinions.

4,506,374
HYBRID COLLIMATOR

Michael J. Flynn, Gregory, Mich., assignor to Technicare Corporation, Solon, Ohio

Filed Apr. 8, 1982, Ser. No. 366,791
Int. Cl.³ G03B 41/16
U.S. Cl. 378—2 5 Claims



1. A hybrid collimator for a gamma ray imaging detector of the type having a planar face adapted for positioning adjacent a portion of an object being studied, said hybrid collimator comprising:
(a) a radiopaque code plate having a prescribed pattern of radiotransparent apertures representing a pseudorandom code sequence in the form of uniform lateral apertures arranged in parallel for the passage of radiation therethrough, said plate oriented generally parallel to the face of the detector and disposed in front of said detector;
(b) a multi-channel collimator having a multiplicity of spaced apart plates, adjacent pairs of which define an opening for the passage of radiation therethrough, the separation between said adjacent pair of said plates defining the thickness of the opening, with the lengthwise orientation of said openings being orthogonal to the orientation of the apertures of said code plate, said multi-channel collimator disposed between said detector and said plate; and
(c) means for advancing said plate relative to said collimator across the face of the detector in a direction parallel to the lengthwise orientation of the openings in said multi-channel collimator so that the portion of said collimator permitted to transmit radiation to said detector is time dependent, whereby images of the distribution of radiation emanating from a plurality of planes passing through the object being studied is reconstructed.

4,506,375
X-RAY CALIBRATION SYSTEM

James E. Manson, P.O. Box 1288, Concord, Mass. 01742

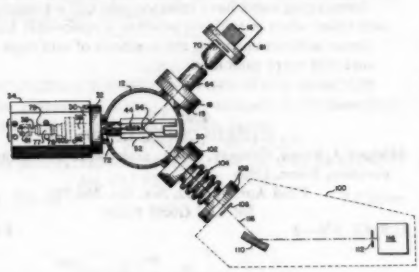
Filed Sep. 27, 1983, Ser. No. 461,642
Int. Cl.³ G01T 1/16
U.S. Cl. 378—207 19 Claims

1. A system for the radiometric calibration of an X-ray detector comprising:

means for providing a substantially point source of X-ray radiation;

a first port for providing a first beam of radiation emanating fro[illegible]d point source;

a secon[illegible]ort for providing a second beam of radiation emanating from said point source, the second beam being disposed at an angle with respect to the first beam, the apparent intensity of said point source at the center of said second port being substantially identical to the apparent intensity of said point source at the center of said first port;



a reference detector for intercepting and measuring a known portion of the first beam of radiation;

means for positioning a detector to be calibrated to intercept and measure a known portion of the second beam of radiation; and

means for analyzing the output of said reference detector to determine the intensity of said point source for calibration of the detector to be calibrated.

4,506,376

SUBCARRIER SIGNAL GENERATOR FOR USE IN STEREO TUNERS

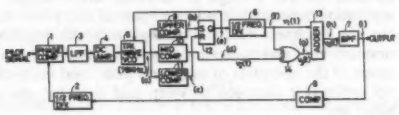
Tadashi Noguchi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 16, 1982, Ser. No. 450,174

Claims priority, application Japan, Dec. 17, 1981, 56-204186; Dec. 18, 1981, 56-204707

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—4 **7 Claims**



1. A subcarrier signal generator for use in a stereo tuner, comprising:

means for generating a symmetrical triangular wave signal in synchronism with a stereo pilot signal and having a fundamental of a frequency which is a multiple of a frequency of the stereo pilot signal, said triangular wave signal havng a highest level, a lowest level, and a midlevel between said highest and lowest levels;

first means for generating a first rectangular wave signal by comparing said triangular wave signal with said midlevel thereof as a reference;

second means for generating a second rectangular wave signal having a pulse width equal to a time interval between adjacent highest and lowest levels of said triangular wave signal;

means for frequency-dividing said second rectangular wave signal to provide a frequency divided signal;

level coincidence detector means responsive to said frequency divided signal and said first rectangular wave signal for generating an output;

means for adding said frequency divided signal and said output from said level coincidence detector means at a certain level ratio; and

means for extracting a fundamental component from an output of said adding means to produce a subcarrier signal.

4,506,377

SPOKEN-INSTRUCTION CONTROLLED SYSTEM FOR AN AUTOMOTIVE VEHICLE

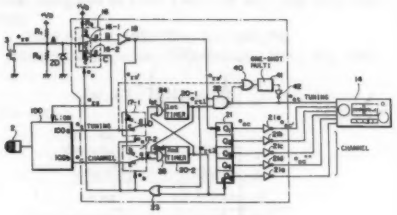
Norimasa Kishi, Yokohama; Kazunori Noso, and Toru Futami, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 16, 1982, Ser. No. 408,702

Claims priority, application Japan, Oct. 22, 1981, 56-169169

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—41 **12 Claims**



1. A spoken-instruction controlled system for an automotive vehicle which can activate an actuator in response to a predetermined spoken instruction inputted through a microphone, which comprises:

(a) recognition switch for outputting a recognition switch signal when closed;

(b) a speech recognizer responsive to said recognition switch signal for outputting a command signal in response to the predetermined spoken instruction inputted thereto through the microphone when said recognition switch is first closed;

(c) means for holding the command signal from said speech recognizer for a predetermined time period; and p1 (d) means responsive to said holding means and said recognition switch signal for outputting an actuator signal repeatedly when said recognition switch is closed repeatedly while said holding means is holding the command signal.

4,506,378

SPOKEN-INSTRUCTION CONTROLLED SYSTEM FOR AN AUTOMOTIVE VEHICLE

Kazunori Noso; Norimasa Kishi; Toru Futami; Hiroyuki Nomura, and Yasuhiro Shiraishi, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 16, 1982, Ser. No. 408,700

Claims priority, application Japan, Oct. 6, 1981, 56-158154

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—43 **9 Claims**

1. A spoken-instruction controlled system for an automotive vehicle which can stop at least one moving device being driven by a motor in either of two opposite directions in response to a predetermined spoken instruction inputted through a microphone, which comprises:

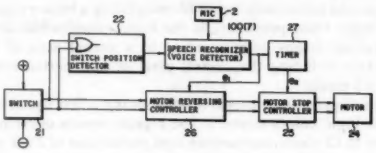
(a) at least one switch for outputting either of two kinds of signals from two output terminals thereof, separately, and for driving the at least one device in either of two opposite

directions when set to either of two set-positions, respectively;

(b) means for detecting one of the two set-positions in response to either of two signals and outputting signals corresponding thereto;

(c) a speech recognizer for outputting a command signal e_1 in response to the predetermined spoken instruction inputted through the microphone, said speech recognizer being activated by either of two signals from said means for detecting one of the two set-positions, independently;

(d) a timer unit for outputting a command signal e_2 a predetermined time period after the signal e_1 has been applied thereto from said speech recognizer;



(e) at least one means for reversing the motor for outputting a first power signal to drive the motor in one direction in response to one signal outputted from said switch when said switch is set to one set-position and a second power signal to drive the motor in the other opposite direction in response to the other signal outputted from said switch when said switch is set to the other set-position, at least one of the first and second power signals being switched in response to the signal e_1 from said speech recognizer in order to drive the motor reversely; and

(f) at least one means for stopping the motor for cutting off either of the first and second power signals outputted from said means for reversing the motor in response to the signal e_2 outputted from said timer unit in order to stop the motor.

4,506,379

METHOD AND SYSTEM FOR DISCRIMINATING HUMAN VOICE SIGNAL

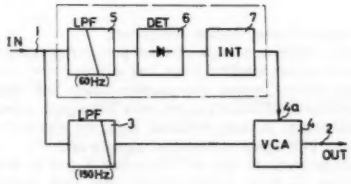
Akira Komatsu, Tokyo, Japan, assignor to Bodysonic Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 251,333, Apr. 6, 1981, abandoned. This application Oct. 13, 1983, Ser. No. 541,483

Claims priority, application Japan, Apr. 21, 1980, 55-54290; Apr. 21, 1980, 55-52682

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—46 **10 Claims**



1. The human voice signal discriminating system comprising:

means for providing an input signal which may contain human voice signals;

means for low-pass filtering said input signal to provide a filtered input signal having frequencies in a range of 0–150 Hz;

control means having an input terminal, output terminal, and control terminal, for receiving said filtered input signal at said input terminal and variably providing said filtered input signal at said output terminal in response to a control signal applied to said control terminal; and

means for low-pass filtering said input signal to provide a control signal to said control terminal in response to frequencies in a range of 0–60 Hz in said input signal to cause said control means to pass said frequencies in said range of 0–150 Hz to said output terminal in response to said control signal resulting from frequencies in said 0–60 Hz range.

4,506,380

METHOD AND APPARATUS FOR CONTROLLING THE SOUND FIELD IN A VEHICLE CABIN OR THE LIKE

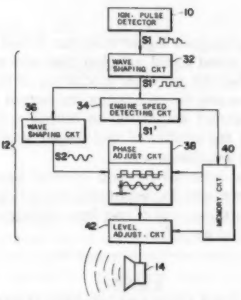
Shinichi Matsui, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 29, 1983, Ser. No. 508,934

Claims priority, application Japan, Jul. 7, 1982, 57-118913

Int. Cl.³ H04R *3/00*

U.S. Cl. 381—71 **14 Claims**



1. A method of controlling the sound field in a space defined by structural panels, comprising the steps of:

pre-storing data indicative of the magnitude of a non-acoustic parameter upon which the tendency for said structural panels to vibrate in said space depends;

sensing the magnitude of said non-acoustic parameter upon which the tendency for said structural panels to vibrate and produce noise in said space is dependent;

producing a signal indicative of the sensed magnitude;

comparing said signal with said pre-stored data; and

producing a vibration within said space in accordance with said comparison of said signal with said data in a manner to cancel the sound produced by the vibration of said structural panels.

4,506,381

AURAL TRANSMITTER DEVICE

Hideyo Ono, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1982, Ser. No. 453,545

Claims priority, application Japan, Dec. 29, 1981, 56-212419; Dec. 29, 1981, 56-212420; Jan. 9, 1982, 57-2061

Int. Cl.³ H04B *15/00*; H03G *3/00*

U.S. Cl. 381—94 **10 Claims**

1. An aural transmitter device, comprising:

a voice feedback amplifier having feedback circuit means for controlling an amplification degree thereof, for amplifying an audio signal input to the transmitter device;

a rectifier circuit means for rectifying said signal;

smoothing circuit means for smoothing an output of said rectifier; and

comparator means for comparing an output voltage of said smoothing circuit means with a reference voltage;

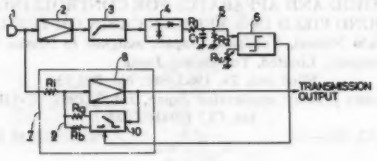
the amount of feedback of said voice feedback amplifier

being controlled according to an output of said comparator means, said feedback causing a larger amplification when said output voltage of said smoothing circuit means is above said reference voltage and causing a smaller but positive amplification when below said reference voltage.

6. An aural transmitter device, comprising:

a first amplifier for amplifying an input sound signal with a predetermined gain and producing an output level;

a second amplifier for amplifying said sound signal with a dynamic gain lower than that of said first amplifier when said sound signal is lower than a predetermined level and



with a dynamic gain higher than that of said first amplifier when said sound signal is higher than said predetermined level, said second amplifier producing an output level;

comparator means for comparing the output levels of said first and second amplifiers, to output a control signal designating the smaller of said output levels of said first and second amplifiers; and

switch means operated by said control signal from said comparator means, for selectively providing as an output signal either the output of said first amplifier or the output of said second amplifier.

4,506,382

APPARATUS FOR DETECTING TWO-DIMENSIONAL PATTERN AND METHOD FOR TRANSFORMING THE PATTERN INTO BINARY IMAGE

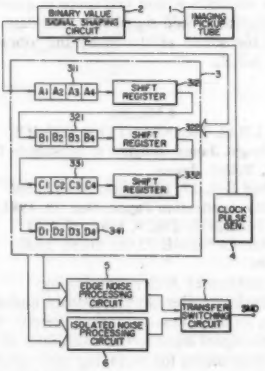
Kazunari Hada, Kawasaki; Norio Fujii, Urawa; Atsushi Kawahara, Kawasaki; Toru Azuma, Tokyo, and Junji Hazama, Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 21, 1982, Ser. No. 370,781

Claims priority, application Japan, Apr. 25, 1981, 56-61912

Int. Cl.³ G06K 9/56; H04N 5/21

U.S. Cl. 382—27 **4 Claims**



1. Two-dimensional pattern detecting apparatus adapted to divide a two-dimensional pattern into an area of at least 4×4 pixels and to represent the density of bright and dark for said pixels by binary logic values, comprising:

(a) register means for storing said binary logic values corresponding to said pixels;

(b) first processing means for comparing a pattern composed of 8 peripheral pixels in a partial area of 3×3 pixels within said area with predetermined patterns on the basis of 8 binary logic values stored in said register means corresponding to said 8 pixels and to output a binary signal of either a logic value stored in said register means corresponding to a central pixel of said partial area when the pattern composed of said 8 pixels coincides with one of said predetermined patterns, or of a logic value prevailing in said 8 binary logic values when the pattern composed of said 8 pixels does not coincide with any of said predetermined patterns;

(c) second processing means for outputting a binary signal of a logic value prevailing in the logic values stored in said register means corresponding to a partial area of 2×2 pixels including the central pixel of said partial area of 3×3 pixels;

(d) third processing means for outputting a first signal when the logic values stored in the register means corresponding to 12 pixels surrounding said partial area of 2×2 pixels are mutually identical and outputting a second signal when the logic values stored in the register means corresponding to said 12 pixels are not mutually identical; and

(e) means for selecting either said binary signal from first processing means in response to said first signal, or said binary signal from second processing means in response to said second signal.

4,506,383

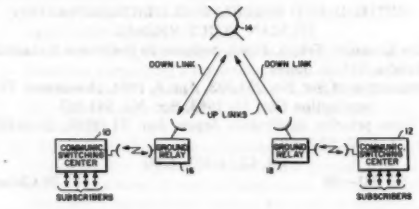
METHOD AND APPARATUS FOR RELAYING SIGNALS BETWEEN A GROUND STATION AND A SATELLITE USING A GROUND RELAY STATION

William E. McGann, Satellite Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 4, 1980, Ser. No. 109,505

Int. Cl.³ H04B 7/15, 7/185

U.S. Cl. 455—17 **16 Claims**



1. A ground relay station comprising:

means to receive a single-channel-per-carrier composite RF multi-carrier satellite down link signal;

means for converting the satellite down link signal to a composite RF multi-carrier relay link signal, wherein said conversion is done without reducing the RF satellite down link signal to baseband signals; and

means to transmit the RF relay link signal to a terminal station to form a microwave relay link between the ground relay station and the terminal station,

wherein the converting means includes means to convert the satellite down link signal to a first composite multi-carrier intermediate frequency signal and means to convert the first intermediate frequency signal to said RF relay link signal, and

wherein said ground relay station further comprises a power splitter coupled to receive said first composite intermediate frequency signal and split it into second and third composite intermediate frequency signals which each contain all of the carriers in said first composite intermedi-

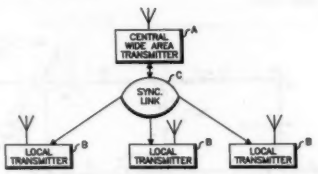
ate frequency signal, and means to convert a group of predetermined carriers of the second composite intermediate frequency signal to baseband signals while the corresponding predetermined carriers of the third composite intermediate frequency signal are converted to said RF relay link signal without being converted to baseband signals.

4,506,384

SYNCHRONIZED, MULTITRANSMITTER, SINGLE FREQUENCY PAGING SYSTEM

Alfred R. Lucas, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 20, 1982, Ser. No. 450,871
Int. Cl.³ H04B 7/26
U.S. Cl. 455—51 **11 Claims**



1. A synchronized communication system for effectively transmitting messages to a plurality of remote mobile receivers wherein said system operates on a single RF communication channel, said system comprising,

a central wide area transmitter which transmits messages to the plurality of mobile receivers,

a plurality of localized transmitters within the wide area which transmits messages to the plurality of mobile receivers,

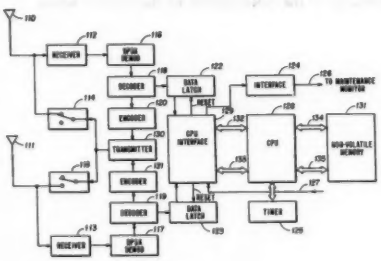
a synchronization link between said central wide area transmitter and said plurality of localized transmitters to create a master-slave relationship wherein said plurality of localized tramsmitters is keyed simultaneously and only when said central wide area transmitter is not keyed.

4,506,385

RADIO RECEPTION PATH MONITOR FOR A DIVERSITY SYSTEM

Chris D. Fedde, Cedar Rapids, Iowa, and Dennis L. Carter, Mountain View, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1982, Ser. No. 452,999
Int. Cl.³ H04B 17/00
U.S. Cl. 455—226 **2 Claims**



1. A radio reception path monitor apparatus comprising:

a. at least two antennas;

b. at least two receivers, each coupled to a different one of said antennas;

c. at least two decoders, each coupled to a different one of said receivers;

d. at least two latches, each coupled to a different one of said decoders wherein a properly decoded signal in one of said decoders triggers the respective latch; and

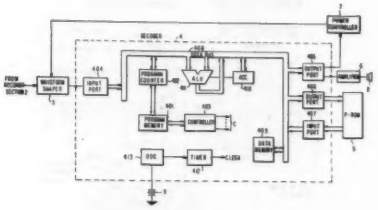
e. means for transferring the state of said latches into a non-volatile memory and for resetting said latches.

4,506,386

BATTERY SAVER FOR A PAGING RECEIVER OR THE LIKE

Yoshio Ichikawa, and Takashi Ohyagi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 24, 1983, Ser. No. 497,638
Claims priority, application Japan, May 28, 1982, 57-90649
Int. Cl.³ H04B 5/04, 1/16
U.S. Cl. 455—343 **9 Claims**



3. A battery saving circuit for use in a portable radio communication apparatus, said apparatus including receiver section means for receiving a carrier wave which is modulated with a digital preamble and a digital identification code, and power supply means for supplying power to said receiver section means in response to a first control signal, said battery saving circuit including decoder means responsive to the output of said receiver section means for respectively detecting a first coincidence between the received preamble code and a first predetermined code and a second coincidence between the received identification code and a second predetermined code, and selectively providing said first control signal to said power supply means, wherein said decoder means further includes;

means for detecting said first coincidence on a bit-by-bit basis, means for periodically transmitting said first control signal, means for suspending said transmission of said first control signal in response to a second control signal, means for continuing said transmission of said first control signal in response to a third control signal, means for immediately producing said second control signal when said first coincidence is not detected, and means for producing said third control signal for a first predetermined period of time in response to detection of said first coincidence.

4,506,387

PROGRAMMING-ON-DEMAND CABLE SYSTEM AND METHOD

Howard F. Walter, P.O. Box 11617, Fort Wayne, Ind. 46859

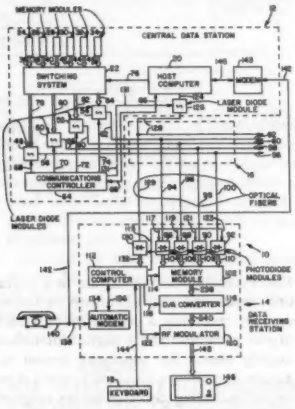
Filed May 25, 1983, Ser. No. 497,885
Int. Cl.³ H04N 7/16
U.S. Cl. 455—612 **14 Claims**

1. In a broadcasting system including a central data station, a data receiving station, a fiber optic line means connecting said central data station and said data receiving station, said central data station including means for converting electrical data to optical data and transmitting said optical data through said fiber optic line means to said data receiving station, said data receiving station including means for reconverting said optical data back to said electrical data, and a broadcasting

means electrically connected to said data receiving station for receiving and broadcasting said electrical data transmitted from said data receiving station, the improvement comprising:

a plurality of memory devices electrically connected to said central data station, each memory device being identifiable by a respective address signal and having a plurality of data cells, each data cell having electrical data representing a portion of a broadcast program preprogrammed therein such that said memory device contains an entire broadcast program, each said memory device being responsive to its received said address signal transmitted thereto from said central data station to transmit its said electrical data to said converting and transmitting means, and

a user-operable generating means near said broadcasting means and operatively connected by telephone line to said central data station for selectively generating any one of



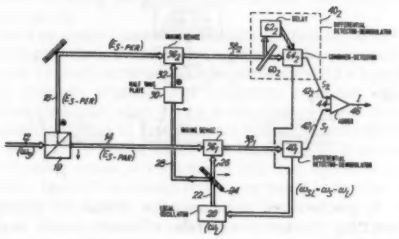
said address signals and transmitting said one address signal to said central data station, whereby said central data station transmits said one address signal to one of said memory devices identified by said one address signal, said one memory device transmitting its said electrical data to said converting and transmitting means for converting said electrical data to pulse code modulated optical data and transmitting said optical data through said fiber optic line means to said data receiving station, said converting and transmitting means comprising a plurality of parallel transmission means for simultaneous transmission of said optical signals representing electrical data in each of said data cells, said reconverting means reconverting said optical data back to said electrical data and said data receiving station transmitting said electrical data to a memory device for selective transmission to said broadcasting means for the broadcast of said broadcast program represented by said electrical data to the user.

4,506,388

PROCESS AND APPARATUS FOR THE COHERENT DETECTION AND DEMODULATION OF A PHASE-MODULATED CARRIER WAVE IN A RANDOM POLARIZATION STATE

Michel Monerie, Bourg de Ploulech, and Alain Leclert, Kerléo Ploulec'h, both of 22300 Lannion, France

Filed Nov. 19, 1982, Ser. No. 443,143
Claims priority, application France, Nov. 26, 1981, 81 22164
Int. Cl.³ H04B 9/00
U.S. Cl. 455—616 **3 Claims**



1. A process for the coherent detection and demodulation of a phase-modulated carrier wave, said carrier wave having a random polarization state, a frequency and a phase and carrying information through said phase, comprising the steps of: generating a local wave having a frequency different from said frequency of said carrier wave, separating said carrier wave into two components having orthogonal polarization directions, dividing said local wave into two local partial waves having orthogonal polarization directions respectively identical to the polarization directions of the two components of the carrier wave, mixing each component of said carrier wave with the local partial wave having the same polarization direction to form two mixed waves, each mixed wave having a period, carrying out a differential detection-demodulation on each mixed wave by delaying each mixed wave by a period to form a corresponding delayed wave and combining each mixed wave with the corresponding delayed wave to obtain two electrical detection-demodulation signals, adding said two electrical detection-demodulation signals to generate an output dependent on said information carried by said carrier wave and independent of the polarization of the carrier wave.

DESIGN PATENTS

GRANTED MAR. 19, 1985

ERRATA

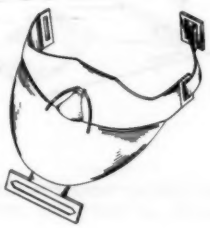
For CLASS	See PATENT NO.
D23–004	278,082

DESIGNS

MARCH 19, 1985

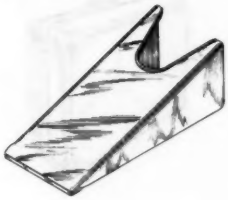
277,994
ORNAMENTAL DESIGN FOR A CHOCOLATE REPRESENTING A PERSONAL COMPUTER
Masao Sekiyama, Tokyo, Japan, assignor to Akutagawa Confectionary Co., Ltd., Tokyo, Japan
Filed Dec. 22, 1982, Ser. No. 452,032
Claims priority, application Japan, Oct. 30, 1982, 57-49445
Term of patent 14 years
U.S. Cl. D1—106

277,995
HEADWORN GOLF PRACTICE AID
John R. Hand, Jr., Wood River, Ill., assignor to John Hand Enterprises, Inc., Alton, Ill.
Filed May 21, 1982, Ser. No. 380,540
Term of patent 14 years
U.S. Cl. D2—241



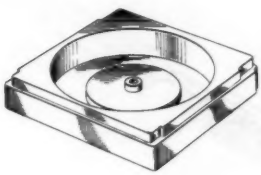
277,996
HEADBAND
Theresa M. Megargee, 14 Milo Dr., Madison, Conn. 06443
Filed Nov. 12, 1982, Ser. No. 440,814
Term of patent 14 years
U.S. Cl. D2—250

277,997
BOOT JACK
Tommy D. Horner, 4631 Kipling St., Apt. No. 62, Wheat Ridge, Colo. 80033
Filed Nov. 24, 1982, Ser. No. 444,160
Term of patent 14 years
U.S. Cl. D2—378.2



277,998
THIMBLE
Veoma E. Van Noy, 2300 Dickerson, Apt. #33, Reno, Nev. 89503
Filed May 19, 1982, Ser. No. 379,733
Term of patent 14 years
U.S. Cl. D3—29

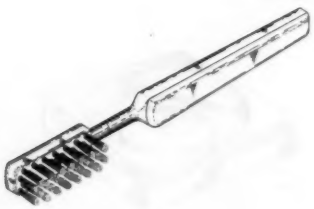
277,999
HOLDER FOR A TYPE FONT DISC
Alvin J. Weiner, 112 Warren St., Randolph, Mass. 02368
Filed Sep. 30, 1982, Ser. No. 429,303
Term of patent 14 years
U.S. Cl. D3—35



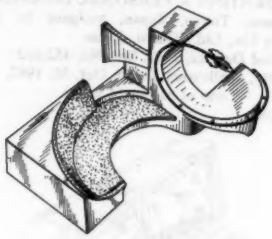
278,000
ATTACHE CASE
Mark B. Nordstrom, Denver, and David E. Workman, Evergreen, both of Colo., assignors to Samsonite Corporation, Denver, Colo.
Filed Nov. 12, 1981, Ser. No. 320,440
Term of patent 14 years
U.S. Cl. D3—76

278,001
LUGGAGE
Ted Stark, Jersey City, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Apr. 6, 1981, Ser. No. 251,095
Term of patent 14 years
U.S. Cl. D3—77

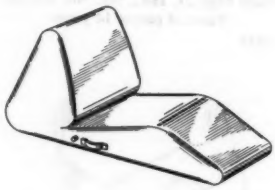
278,002
TOOTHBRUSH
Virgil R. Swope, Jr., 6910 Stoneman Dr., North Highlands, Calif. 95660
Filed Sep. 23, 1982, Ser. No. 421,934
Term of patent 14 years
U.S. Cl. D4—104



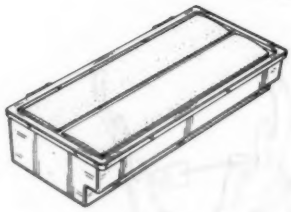
278,003
COMBINED SEAT, TABLE, AND SHELF UNIT
Stephen J. Gagliano, 35 Coral Ct., Malverne, N.Y. 11565
Filed Jul. 14, 1982, Ser. No. 398,410
Term of patent 14 years
U.S. Cl. D6—336



278,004
INFLATABLE LOUNGE SEAT
Carmelo J. Sigona, 51 Columbia Ave., Paterson, N.J.
Filed May 20, 1982, Ser. No. 380,208
Term of patent 14 years
U.S. Cl. D6—361



278,005
SHEET MATERIAL DISPENSER OR THE LIKE
Martin J. Wolff, North Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 10, 1982, Ser. No. 406,841
Term of patent 14 years
U.S. Cl. D6—518

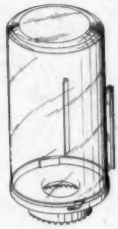


278,006

DISPENSER FOR SANITARY PAPER

Ingemar Sjöstedt, Västra Frölunda, and Bertil Lunden, Hovås, both of Sweden, assignors to Molnlycke Aktiebolag, Gothenburg, Sweden

Filed Sep. 28, 1982, Ser. No. 425,269
Claims priority, application Sweden, Apr. 1, 1982, 82-0854
Term of patent 14 years
U.S. Cl. D6—523

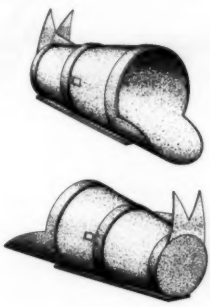


278,007

TOILET TISSUE HOLDING DEVICE OR THE LIKE

Emily J. Collymore, 3103 Mandy La., Morehead City, N.C. 28557

Filed Mar. 24, 1983, Ser. No. 478,305
Term of patent 14 years
U.S. Cl. D6—523



278,008

SUSPENDED HOLDER FOR PLANTS, CANDLES OR THE LIKE

David M. F. Chan, 1213 King Dr., El Cerrito, Calif. 94530, and Michael L. F. Chan, 1407 Arch St., Berkeley, Calif. 94708

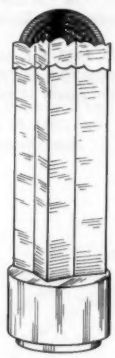
Filed Sep. 15, 1983, Ser. No. 532,658
Term of patent 14 years
U.S. Cl. D6—514

278,009

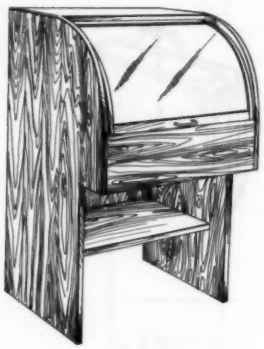
PORTABLE FLOOR DISPLAY STAND

Kenneth E. Lindstrom, Colorado Springs, Colo., assignor to Lawrence Jewelry Co., Hopkins, Minn.

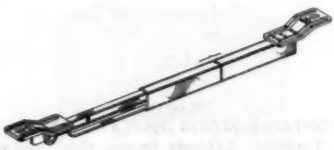
Filed Jun. 28, 1982, Ser. No. 393,077
The portion of the term of this patent subsequent to Mar. 19, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—455



278,010
ACOUSTICAL ENCLOSURE
Stephen F. Ostrander, 810 Main St., West Newbury, Mass. 01985
Filed Jun. 25, 1982, Ser. No. 392,236
Term of patent 14 years
U.S. Cl. D6—472

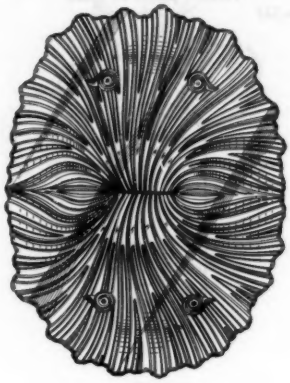


278,011
DRAWER-SUPPORTING ADJUSTABLE RAIL FOR ATTACHMENT TO BED SIDE RAILS
Melvin P. Spitz, 619 N. Elm Dr., Beverly Hills, Calif. 90210
Filed Jan. 6, 1983, Ser. No. 456,063
Term of patent 14 years
U.S. Cl. D6—503

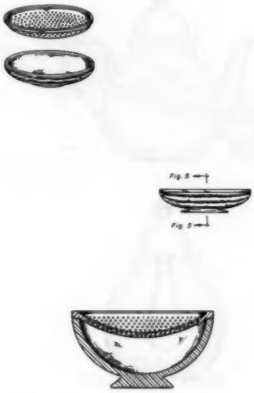


278,012
COVER FOR CHAIR LEG
Frank Doerner, 138 Aberdeen Rd., Kitchener, Ontario, Canada N2M 2Y7
Filed Jan. 27, 1983, Ser. No. 461,579
Claims priority, application Canada, Nov. 30, 1982, 30-11-82-6
Term of patent 14 years
U.S. Cl. D6—495

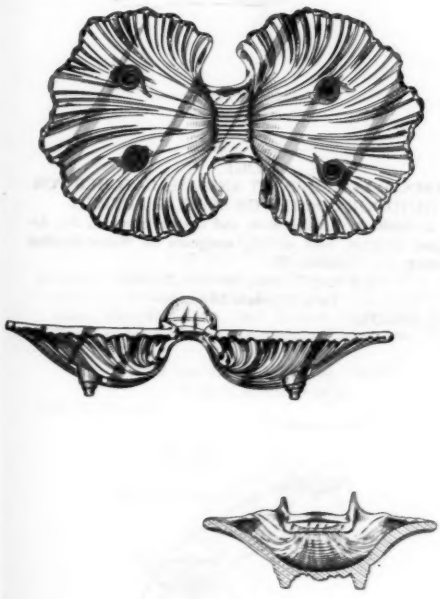
278,013
PLATTER
Larry R. Laslo, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Dec. 22, 1982, Ser. No. 452,381
Term of patent 14 years
U.S. Cl. D7—1



278,014
WATERMELON DISH
James M. Faris, 31 Briarcliff Rd., Atco, N.J. 08004
Filed Jul. 19, 1982, Ser. No. 399,760
Term of patent 14 years
U.S. Cl. D7—3



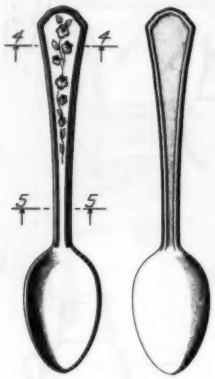
278,015
RELISH TRAY
Larry R. Laslo, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Dec. 22, 1982, Ser. No. 452,380
Term of patent 14 years
U.S. Cl. D7—5



278,016
DRINKING VESSEL
Cheryl L. Myrbo, 412 Beacon Ave., Saint Paul, Minn. 55104
Filed Jul. 21, 1982, Ser. No. 400,371
Term of patent 14 years
U.S. Cl. D7—9

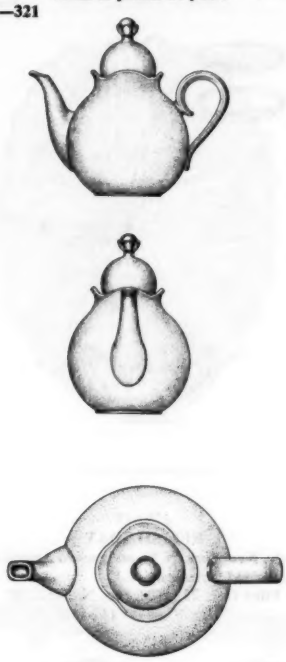
278,017
SWIZZLE STICK
Clyde J. Martin, 8767 Appleknoll La., Cincinnati, Ohio 45236
Filed Oct. 18, 1982, Ser. No. 434,759
Term of patent 14 years
U.S. Cl. D7—42

278,018
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Sep. 27, 1982, Ser. No. 424,324
Term of patent 14 years
U.S. Cl. D7—150



278,019
CREAM PITCHER
Walter Everhan, Weisshausstrasse 34-38, D-5000 Kohn 41, Fed. Rep. of Germany
Filed Nov. 3, 1982, Ser. No. 438,946
Term of patent 14 years
U.S. Cl. D7—319

278,020
TEAPOT
Walter Everhan, Weisshausstrasse 34-38, D-5000 Kohn 41, Fed. Rep. of Germany
Filed Nov. 3, 1982, Ser. No. 438,979
Term of patent 14 years
U.S. Cl. D7—321



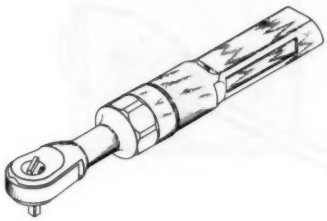
278,021
COMBINED LEG SUPPORT AND ASH CATCHER FOR OUTDOOR COOKER OR SIMILAR ARTICLE
Erich J. Schlosser, Lindenhurst, and George Stephen, Jr., Arlington Heights, both of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.
Filed May 7, 1982, Ser. No. 375,808
Term of patent 14 years
U.S. Cl. D7—332

278,022
PUSH STICK FOR A SAW TABLE OR THE LIKE
William F. Ash, Dayton, Ohio, assignor to Shopsmith, Inc., Dayton, Ohio
Filed Sep. 2, 1982, Ser. No. 414,169
Term of patent 14 years
U.S. Cl. D8—14

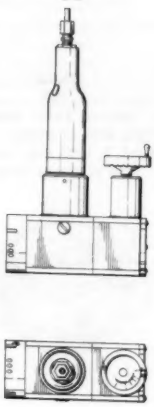
278,023
BOTTLE OPENER
Bradley N. Junes, Rte. 5, Box 52AA, Astoria, Oreg. 97103
Filed Sep. 20, 1982, Ser. No. 419,955
Term of patent 14 years
U.S. Cl. D8—40

278,024
TAB TOP CAN OPENER
Ronald J. Hoffman, Germantown, Tenn.; Joy E. Tiffin, Alexandria, Va.; Paula L. Kovarik, Memphis, Tenn.; Susan C. Moinester, Memphis, Tenn., and Thomas H. Miller, Cordova, Tenn., assignors to The Ron Hoffman Group, Inc., Memphis, Tenn.
Filed Apr. 12, 1983, Ser. No. 484,277
Term of patent 14 years
U.S. Cl. D8—40

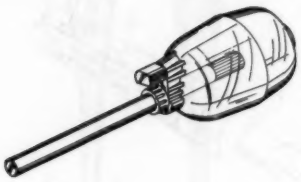
278,025
PORTABLE PNEUMATIC TOOL HOUSING
William B. Fleischer, Jr., Ridgefield, Conn., assignor to Upneumat International, Inc., Ridgefield, Conn.
Filed Sep. 1, 1982, Ser. No. 413,730
Term of patent 14 years
U.S. Cl. D8—61



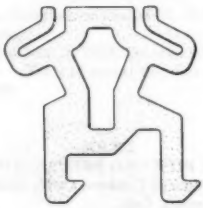
278,026
PORTABLE PIPE END PREPARATION TOOL
William H. Astle, Rancho Cordova, Calif., assignor to Tri Tool, Inc., Rancho Cordova, Calif.
Filed Mar. 15, 1983, Ser. No. 475,530
Term of patent 14 years
U.S. Cl. D8—61



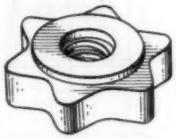
278,027
SCREW DRIVER
Lee S. Tang, 14th Flr., Flat B, Kin Hing Industrial Bldg., 17-23 Shek Kin St.,, Kwai Chung, N.T., Kowloon, Hong Kong
Filed Jun. 30, 1981, Ser. No. 279,135
Claims priority, application United Kingdom, Dec. 30, 1980, 998263
Term of patent 14 years
U.S. Cl. D8—82



278,028
CONNECTING ELEMENT FOR STRUT MEMBERS OR THE LIKE
Gregg R. Fleishman, 6071 Hargis St., Los Angeles, Calif. 90034
Filed Sep. 16, 1982, Ser. No. 421,359
Term of patent 14 years
U.S. Cl. D8—354

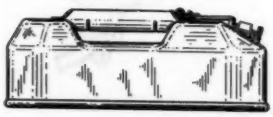


278,029
NUT
Lenny Suponitsky, Tarzana, Calif., assignor to Bob Bollinger and Glenn Bollinger, both of Irving, Tex.
Filed Jul. 1, 1983, Ser. No. 510,064
Term of patent 14 years
U.S. Cl. D8—397

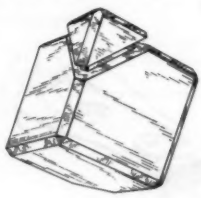


278,030
COMBINED BOTTLE AND CAP
Daniel Drummond, Paris, France, assignor to Lever Brothers Company, New York, N.Y.
Filed Mar. 17, 1982, Ser. No. 358,988
Claims priority, application France, Sep. 17, 1981, 81 3185
Term of patent 14 years
U.S. Cl. D9—376

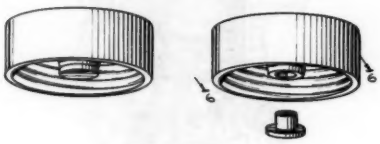
278,031
FUEL CONTAINER
John R. Elmburg, Miami, Okla., assignor to U.S. Metal Container Company, Miami, Okla.
Filed Jul. 12, 1982, Ser. No. 397,675
Term of patent 14 years
U.S. Cl. D9—376



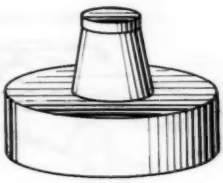
278,032
PERFUME BOTTLE
Alain de Mourgues, Paris, France, assignor to Helena Rubinstein, Inc., Secaucus, N.J.
Filed Mar. 10, 1982, Ser. No. 356,689
Claims priority, application France, Oct. 20, 1981, 81 3604; United Kingdom, Nov. 25, 1981, 1003796
Term of patent 14 years
U.S. Cl. D9—400



278,033
COMBINED RECEPTACLE CAP AND CAPSULE PIERCING DEVICE THEREFOR
Florence Borkan, Morristown, N.J., and Thomas A. Cafiero, Brooklyn, N.Y., assignors to Pharmacaps, Inc., Elizabeth, N.J.
Filed Sep. 8, 1982, Ser. No. 415,975
Term of patent 14 years
U.S. Cl. D9—437

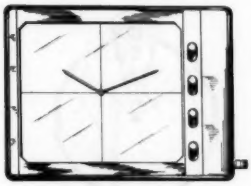


278,034
COMBINED RECEPTACLE CAP AND CAPSULE PIERCING DEVICE THEREFOR
Thomas A. Cafiero, Brooklyn, N.Y., and Florence Borkan, Morristown, N.J., assignors to Pharmacaps, Inc., Elizabeth, N.J.
Filed Sep. 8, 1982, Ser. No. 415,976
Term of patent 14 years
U.S. Cl. D9—437



278,035
CLOCK
Maurice Progin, ch. de la Vuachère 20, P.O. Box 42, 1000 Lausanne 5, Switzerland
Filed Oct. 22, 1982, Ser. No. 436,079
Claims priority, application Hague, Apr. 26, 1982, 72330
Term of patent 14 years
U.S. Cl. D10—7

278,036
POCKET WATCH
Satoko Maruyama, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan
Filed Sep. 8, 1982, Ser. No. 415,818
Claims priority, application Japan, Mar. 12, 1982, 57/10076
Term of patent 14 years
U.S. Cl. D10—30



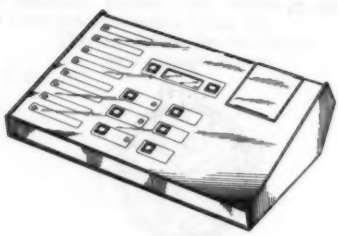
278,037
POCKET WATCH
Shinjiro Hattori, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan
Filed Sep. 8, 1982, Ser. No. 415,918
Claims priority, application Japan, Mar. 12, 1982, 57/10077
Term of patent 14 years
U.S. Cl. D10—30

278,038
POCKET WATCH
Tsuyoshi Onodera, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan
Filed Sep. 22, 1982, Ser. No. 421,521
Claims priority, application Japan, Mar. 29, 1982, 57/12993
Term of patent 14 years
U.S. Cl. D10—30

278,039
POCKET WATCH
Shigeo Sakai, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan
Filed Sep. 22, 1982, Ser. No. 421,522
Claims priority, application Japan, Apr. 22, 1982, 57-17445
Term of patent 14 years
U.S. Cl. D10—37

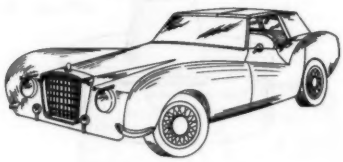
278,040
DIVINING ROD
William J. Conley, 36 Hervey St., Brockton, Mass. 02401
Filed Aug. 23, 1982, Ser. No. 410,852
Term of patent 14 years
U.S. Cl. D10—46

278,041
ELECTRONIC TESTER OR THE LIKE
Frank M. Clarke, North Babylon, N.Y., assignor to TII Electronics, Inc., Copiague, N.Y.
Filed Oct. 22, 1982, Ser. No. 436,000
Term of patent 14 years
U.S. Cl. D10—75

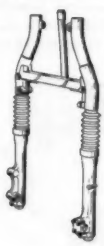


278,042
HANGING ORNAMENT
Brigitte Breyer-Lindner, Bahnhofplatz 5, 8045 Ismaning, Fed. Rep. of Germany
Filed Feb. 24, 1982, Ser. No. 351,751
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 11 AR 2673/81
Term of patent 14 years
U.S. Cl. D11—125

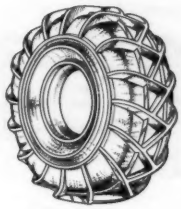
278,043
AUTOMOBILE
Steven P. Avery, 3 Dunn Rd., Ashburnham, Mass. 01430
Filed Apr. 12, 1982, Ser. No. 367,552
Term of patent 14 years
U.S. Cl. D12—92



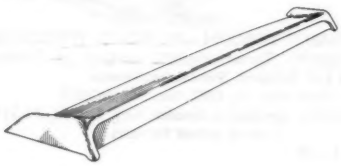
278,044
FRONT FORK FOR THREE-WHEELED MOTOR VEHICLE
Yasuhiro Ohba, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 30, 1982, Ser. No. 431,162
Claims priority, application Japan, May 7, 1982, 57/19772
Term of patent 14 years
U.S. Cl. D12—118



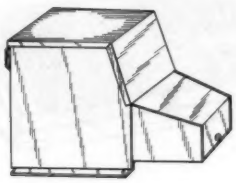
278,045
ROAD WHEEL TIRE
Yasuhiro Oba, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Ohtsu Tire & Rubber Co., Ltd, Osaka, both of, Japan
Filed Mar. 16, 1982, Ser. No. 358,573
Claims priority, application Japan, Sep. 18, 1981, 56-41351
Term of patent 14 years
U.S. Cl. D12—147



278,046
REAR SPOILER
Hans Kerschbaum, Oberdachstetten, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A. G., Munich, Fed. Rep. of Germany
Filed Jul. 16, 1982, Ser. No. 398,935
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1982, MR 12822
Term of patent 14 years
U.S. Cl. D12—181



278,047
APPARATUS FOR CHARGING THE BATTERIES OF STALLED VEHICLES
William E. Puckett, Oklahoma City, and Ladd M. Adams, Norman, both of Okla., assignors to Smart Start Corporation, Oklahoma City, Okla.
Filed Jul. 28, 1982, Ser. No. 402,647
Term of patent 14 years
U.S. Cl. D13—5



278,048
LIGHT-EMITTING DIODE SEMICONDUCTOR CHIP WITH LEADS
Kaoru Takahashi, Zama, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Apr. 28, 1982, Ser. No. 372,642
Claims priority, application Japan, Oct. 30, 1981, 56-48471; Oct. 30, 1981, 56-48472
Term of patent 14 years
U.S. Cl. D13—12

278,049
LIGHT-EMITTING DIODE SEMICONDUCTOR CHIP WITH LEADS
Kaoru Takahashi, Zama, and Minoru Koyama, Tokyo, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Apr. 28, 1982, Ser. No. 372,643
Claims priority, application Japan, Oct. 30, 1981, 56-48469; Oct. 30, 1981, 56-48470
Term of patent 14 years
U.S. Cl. D13—12

278,050
THERMAL DETECTOR
Stanley Brenner, Massapequa; James N. Pearse, Dix Hills, and George E. Johnson, Bronxville, all of N.Y., assignors to Leviton Manufacturing Co. Inc., Little Neck, N.Y.
Filed Oct. 25, 1982, Ser. No. 436,260
Term of patent 14 years
U.S. Cl. D13—34

278,051

CASSETTE PLAYER

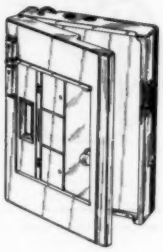
Takeshi Arimura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 382,656, May 27, 1982, Pat. No. Des. 276,999. This application Jun. 20, 1984, Ser. No. 622,494

Claims priority, application Japan, Dec. 11, 1981, 56-84596; Feb. 24, 1982, 57-7290

Term of patent 14 years

U.S. Cl. D14—6



278,052

TELEPHONE

Eric J. Marshall, London, United Kingdom, assignor to The Marshall Telephone Corporation Limited, Kent, England

Filed Dec. 4, 1981, Ser. No. 327,562

Claims priority, application United Kingdom, Jun. 4, 1981, 1000805

Term of patent 14 years

U.S. Cl. D14—53

278,053

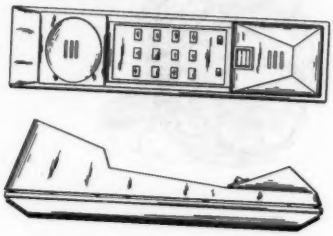
HANDSET TELEPHONE

Walter A. Menn, Stamford, Conn.; Alexander Sarkis, Jr, Glen Cove, N.Y.; Steve W. Haskins, Mount Juliet; Eugene Barber, Glen, and James M. Sharp, Corinth, both of Miss., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,356

Term of patent 14 years

U.S. Cl. D14—53



278,054

COMBINED INTERCOM AND STAND THEREFOR

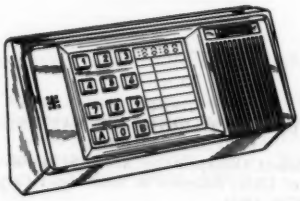
Gyeorgy Vajdaffy, Tyreso, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

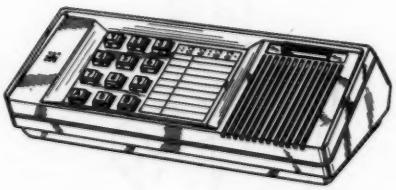
Filed Mar. 26, 1982, Ser. No. 362,075

Claims priority, application Sweden, Oct. 2, 1981, 81-2175

Term of patent 14 years

U.S. Cl. D14—58





278,055

COMBINED INTERCOM AND TELEPHONE KEY BASE

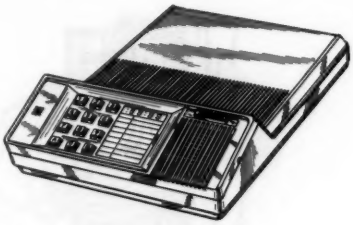
Gyeorgy Vajdaffy, Tyreso, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Mar. 26, 1982, Ser. No. 362,134

Claims priority, application Sweden, Oct. 2, 1981, 81-2174

Term of patent 14 years

U.S. Cl. D14—58



278,056

TELEPHONE BASE

Donald M. Genaro, Haworth, N.J.; Jerome M. Gotway; Norris R. Hall, both of Indianapolis, Ind., and John N. McGarvey, Drexel Hill, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 455,888, Jan. 5, 1983,. This application May 21, 1984, Ser. No. 612,465

Term of patent 14 years

U.S. Cl. D14—60

278,057

SHOULDER REST FOR TELEPHONE HANDSET

Thomas W. McMaster, Salt Lake City, Utah, assignor to Transworld Products, Inc., Salt Lake City, Utah

Filed Jul. 12, 1982, Ser. No. 397,123

Term of patent 14 years

U.S. Cl. D14—65

278,058

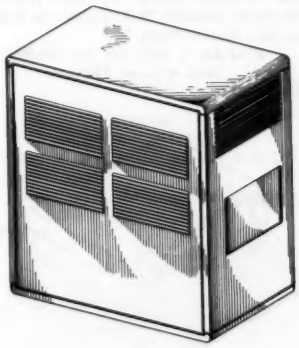
RADIO BASE STATION CABINET OR SIMILAR ARTICLE

Kenneth W. Larson, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 16, 1982, Ser. No. 408,360

Term of patent 14 years

U.S. Cl. D14—68

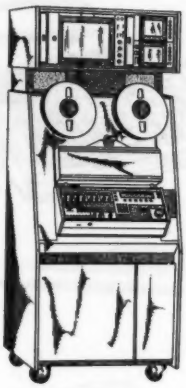


278,059
COMBINED PORTABLE DATA ENTRY TERMINAL AND EXPANSION BASE THEREFOR
Franklin J. Desrochers, Davison, Mich., assignor to Universal Data, Inc., Clarkston, Mich.
Filed Apr. 23, 1982, Ser. No. 371,050
Term of patent 14 years
U.S. Cl. D14—100

278,060
COMPUTER
Isao Kitai, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 3, 1982, Ser. No. 374,494
Claims priority, application Japan, Nov. 6, 1981, 56-49752
Term of patent 14 years
U.S. Cl. D14—100

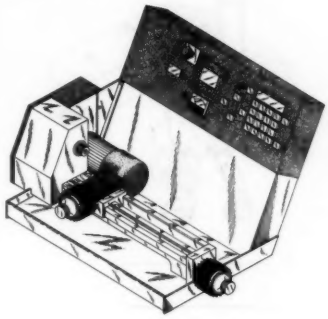
278,061
CASE FOR AN ELECTRONIC ACCOUNTING MACHINE
David Wiechnicki, Boonton, N.J., assignor to Litton Business Systems, Inc., Morris Plains, N.J.
Filed Jul. 6, 1982, Ser. No. 395,395
Term of patent 14 years
U.S. Cl. D14—100

278,062
TAPE TRANSPORT
George A. Wilson, Portola Valley, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Sep. 16, 1982, Ser. No. 418,908
Term of patent 14 years
U.S. Cl. D14—108



278,063
KEYBOARD ENCLOSURE FOR A PERSONAL COMPUTER OR THE LIKE
Edward Chamberlain, Poughquag, N.Y.; Tommy R. Hardy, Lexington, Ky.; Nicholas M. Leon, Winchester, England; Peter J. Mendel, Rochester, Minn., and Michael H. Sharp, Winchester, England, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 28, 1982, Ser. No. 402,688
Term of patent 14 years
U.S. Cl. D14—100

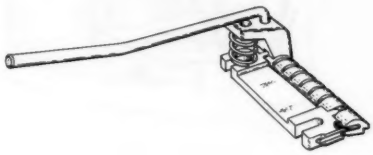
278,064
NUMERICALLY CONTROLLED LATHE
Winfried Nemetz, Salzburg, Austria, assignor to Maier & Co., Salzburg, Austria
Filed Apr. 29, 1982, Ser. No. 373,258
Claims priority, application Austria, Oct. 30, 1981, 15385
Term of patent 14 years
U.S. Cl. D15—130



278,065
BORING TOOL OR SIMILAR ARTICLE
William E. Sydlowski, Wakefield, Mass., and Harold A. Trent, San Leandro, Calif., assignors to Rule Industries, Inc., Gloucester, Mass.
Filed Feb. 8, 1982, Ser. No. 346,614
Term of patent 14 years
U.S. Cl. D15—139

278,066
PORTABLE MUSICAL SYNTHESIZER
Richard J. Garoogian, 3344 E. Dakota Ave., Apt. 224, Fresno, Calif. 93726
Filed Aug. 27, 1982, Ser. No. 412,291
Term of patent 14 years
U.S. Cl. D17—1

278,067
VIBRATO TAIL PIECE
Dewey L. Bowen, 1053 Eighth Ave., San Diego, Calif. 92101
Filed Dec. 30, 1982, Ser. No. 436,967
Term of patent 14 years
U.S. Cl. D17—14



278,068
DRAFTING TEMPLATE
Richard A. Sager, Lapeer, Mich., assignor to P.T.L. Engineering, Lake Orion, Mich.
Filed Sep. 30, 1982, Ser. No. 431,650
Term of patent 14 years
U.S. Cl. D19—37

278,069
SLOT MACHINE
Michael Wichinsky, and Leroy H. Gutknecht, both of 2607 S. Highland Dr., Las Vegas, Nev. 89109
Filed Sep. 30, 1982, Ser. No. 429,556
Term of patent 14 years
U.S. Cl. D21—38

278,070
ACTIVITY TOY
Erik P. Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Jun. 11, 1982, Ser. No. 387,281
Term of patent 14 years
U.S. Cl. D21—59

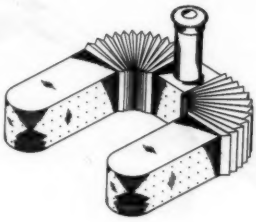
278,071
TOY BIRD RATTLE
Terry Paczko, Cleveland, Ohio, assignor to Questor Corp., Tampa, Fla.
Filed Sep. 30, 1982, Ser. No. 431,669
Term of patent 14 years
U.S. Cl. D21—65

278,072
TOY ANIMAL
Kouichi Urabe, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Japan
Filed Jul. 14, 1982, Ser. No. 397,985
Claims priority, application Japan, Oct. 8, 1981, 56-44680
Term of patent 14 years
U.S. Cl. D21—148

278,073
BALL HITTING RACQUET
Bruno Pozzi, 11 Carriage Sq., Oxnard, Calif. 93030
Filed Sep. 22, 1982, Ser. No. 421,104
Term of patent 14 years
U.S. Cl. D21—210

278,074
WATER FLOAT
Janice M. Westler, Highland Park, and Robert Shattow, Morton Grove, both of Ill., assignors to Kransco Manufacturing, Inc., South San Francisco, Calif.
Filed Nov. 30, 1982, Ser. No. 445,843
Term of patent 14 years
U.S. Cl. D21—237

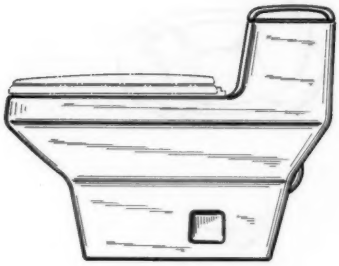
278,075
PLANT IRRIGATOR
Darwin E. Dryden, 4304 S. Euclyptus Ave., Tulsa, Okla. 74133
Filed Apr. 5, 1982, Ser. No. 365,878
Term of patent 14 years
U.S. Cl. D23—1

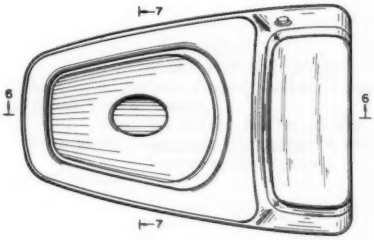


278,076
ROOT IRRIGATOR
Darwin E. Dryden, 4304 S. Euclyptus Ave., Tulsa, Okla. 74133
Filed Jun. 23, 1982, Ser. No. 391,364
Term of patent 14 years
U.S. Cl. D23—1

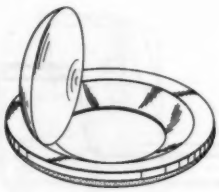
278,077
DOWNSPOUT SCUPPER
Robert R. Lott, 6207 Heath Rd., Waterloo, Iowa 50701
Filed Aug. 19, 1982, Ser. No. 409,579
Term of patent 14 years
U.S. Cl. D23—45

278,078
WATER CLOSET OR SIMILAR ARTICLE
Jack N. Kaiser, Danville, Ky., assignor to American Standard Inc., New York, N.Y.
Filed Feb. 8, 1982, Ser. No. 346,983
Term of patent 14 years
U.S. Cl. D23—65

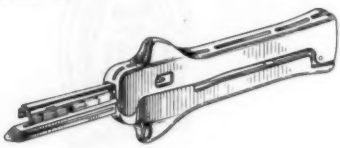




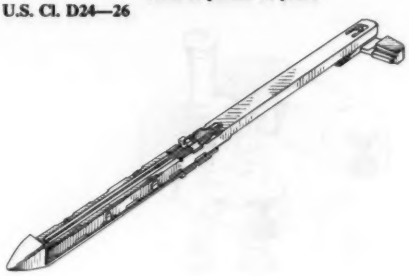
278,079
EXHAUST AIR VALVE
Lennart Widerby, Jönköping, Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden
Filed Jul. 23, 1982, Ser. No. 401,131
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, URA 79/82
Term of patent 14 years
U.S. Cl. D23—19



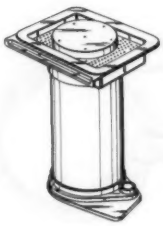
278,080
LINEAR ANASTOMOSIS SURGICAL STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard H. Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Apr. 2, 1982, Ser. No. 364,909
Term of patent 14 years
U.S. Cl. D24—26



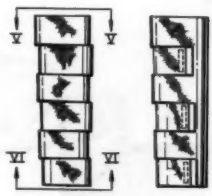
278,081
LINEAR ANASTOMOSIS SURGICAL STAPLE CARTRIDGE
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Apr. 2, 1982, Ser. No. 364,910
Term of patent 14 years
U.S. Cl. D24—26



278,082
SPA FILTER
Harold E. Cowley, 12602 Strathmore, Garden Grove, Calif. 90640
Filed Sep. 7, 1982, Ser. No. 415,408
Term of patent 14 years
U.S. Cl. D23—4



278,083
LEG IMMOBILIZER WITH INTEGRAL STRAPS
Robert H. Meier, Parma, Mich., assignor to Camp International, Inc., Jackson, Mich.
Filed Oct. 20, 1980, Ser. No. 198,878
The portion of the term of this patent subsequent to Jul. 19, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—64



278,084
PORTABLE LAMP

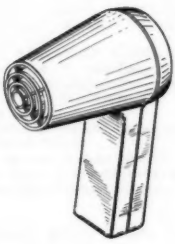
John C. Parker, Tyler; Norman L. Terry, and Bud W. Lester, both of Jacksonville, all of Tex., assignors to Teknovations, Incorporated, Jacksonville, Tex.

Filed Sep. 24, 1982, Ser. No. 423,480
Term of patent 14 years
U.S. Cl. D26—45

278,085
HAIR DRYER

James M. Rittenhouse, Watchung, and James B. Stewart, Randolph, both of N.J., assignors to Conair Corporation, Edison, N.J.

Filed Jul. 7, 1983, Ser. No. 511,638
Term of patent 14 years
U.S. Cl. D28—13



278,086
EYELID ACCESSORY OR SIMILAR ARTICLE

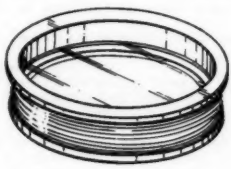
Isadore M. Greenberg, 29001 Cedar Rd., Ste. 510, Lyndhurst, Ohio 44124

Filed Jul. 28, 1983, Ser. No. 518,016
Term of patent 14 years
U.S. Cl. D28—92

278,087
EYEPIECE FOR GAS MASKS

Erwin Pruefer, Foxboro, Canada, assignor to Aoco Limited/-Limitee, Toronto, Canada

Filed Jun. 4, 1982, Ser. No. 385,295
Claims priority, application Canada, Feb. 3, 1982, 0302823
Term of patent 14 years
U.S. Cl. D29—9



278,088
ANTI LARGE BIRD FEEDING PERCH

Peter Kilham, Mill Rd., Foster, R.I. 02825

Filed Mar. 14, 1983, Ser. No. 475,083
Term of patent 14 years
U.S. Cl. D30—13

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF MARCH, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Lamare, Charles-Louis V., 4,505,211, Cl. 110-346.000.

A. H. Robins Company, Inc.: *See*—
Wright, George J.; and Teng, Lina C., 4,505,907, Cl. 514-210.000.

AB Dentatus: *See*—
Edwardson, Svante R., 4,505,674, Cl. 433-59.000.

AB Samefa: *See*—
Bergstrom, Hans R.; and Johansson, Uno, 4,505,145, Cl. 72-457.000.

AB Volvo, Torslanda: *See*—
Moss, Hans B. F., 4,505,693, Cl. 474-240.000.

Abbott Laboratories: *See*—
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Abele, Wolfgang P., to Exxon Research & Engineering Co. Impact resistant bag with increased circumferential yarn strength. 4,505,201, Cl. 102-324.000.

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Sawada, Takeshi; Yoneda, Kou; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, 4,506,220, Cl. 324-252.000.

ABM Industries, Inc.: *See*—
Schwarzberger, Michael, 4,505,212, Cl. 112-118.000.

Abrahamson, Thomas C., to Harrington Tool Company. Tackle box. 4,505,386, Cl. 206-315.110.

Acer Automation Company: *See*—
Maples, Stephen S., 4,505,158, Cl. 73-766.000.

Ackermann, Fritz; and Schnaibel, Eberhard, to Robert Bosch GmbH. Operator-controlled automotive gear or transmission change system. 4,505,368, Cl. 192-0.092.

Acorn Engineering Company: *See*—
Morris, Earl L.; and Hafner, V. Walter, 4,505,189, Cl. 98-40.190.

Acrotechnology Corporation: *See*—
Ashley-Rollman, Charles D., 4,506,230, Cl. 330-10.000.

Adachi, Tomio; Shiozaki, Shigeru; and Tomie, Takashi, to Teijin Limited. Magnetic recording medium. 4,505,966, Cl. 428-141.000.

Adalbert, Gerhard; and Vysiotis, Theodoros, to Robert Bosch GmbH. Vane compressor, particularly a cooling medium compressor for use in air-conditioning equipment of a vehicle. 4,505,656, Cl. 418-270.000.

Adams, Neal J.: *See*—
Schuck, Jack K.; and Adams, Neal J., 4,505,210, Cl. 110-336.000.

Adams, Roy D.: *See*—
Krueger, Gordon P.; Lund, Anders E.; and Adams, Roy D., 4,505,371, Cl. 198-382.000.
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Adelman, Robert W.; and Blevins, Daniel W., to Crowell Corporation, The. Tire inflation. 4,505,309, Cl. 141-97.000.

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Beregi, Laszlo; Hugon, Pierre; Duhault, Jacques; and Boulanger, Michelle, 4,505,921, Cl. 514-212.000.

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Coy, David H.; and Murphy, William A., 4,505,897, Cl. 514-11.000.

Advanced Pumping Systems, Inc.: *See*—
Hoh, Thomas G.; Friedman, Bernard L.; Borchert, Wendall; and Nixon, Eugene H., Jr., 4,505,162, Cl. 74-41.000.

AEG-Kanis Turbinenfabrik GmbH: *See*—
Kuhnlein, Klaus, 4,506,339, Cl. 364-565.000.

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Armand, Michel B.; and El Kadiri Cherkaoui el Moursli, Fouzia, 4,505,997, Cl. 429-192.000.

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Onishi, Toshitada; Tateishi, Hiroshi; Koyama, Kenichi; Saito, Shigeo; and Nagata, Masayuki, 4,506,109, Cl. 174-128.00S.

Agrowparts Pty Ltd.: *See*—
Ryan, John W., 4,505,337, Cl. 72-260.500.

Aichelmann, Frederick J., Jr.; and Lange, Lawrence K., to International Business Machines Corporation. Memory address permutation apparatus. 4,506,364, Cl. 371-38.000.

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Suzuki, Michihiko; Kawaguchi, Katsukiyo; and Kojima, Yoshihiko, 4,505,946, Cl. 427-29.000.

Aigner, Heinrich; Merget, Norbert; Norden, Jurgen; Schweppe, Manfred; and Wetter, Klaus, to Chemische Werke Huls AG. Solid, water-soluble micronutrient mixtures, their preparation and use. 4,505,732, Cl. 71-11.000.

Aihara, Yukichi: *See*—
Makimoto, Mitsuo; Aihara, Yukichi; and Yamashita, Sadahiko, 4,506,241, Cl. 333-222.000.

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Chinone, Naoki; Kashiwada, Yasutoshi; Yamashita, Shigeo; and Aiki, Kunio, 4,506,366, Cl. 372-45.000.

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Senaratne, Gane W., 4,505,505, Cl. 294-64.100.

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Mandon, Jean-Pierre, 4,505,429, Cl. 239-56.000.

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Hada, Toshikatsu; and Isoya, Yukinori, 4,505,250, Cl. 123-540.000.

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Nakamura, Kaoru, 4,505,112, Cl. 60-533.000.
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Akagi, Noriyuki: *See*—
Ogawa, Yoshinari; Sakai, Kouichi; and Akagi, Noriyuki, 4,506,043, Cl. 523-523.000.

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Mills, Aubrey C.; and Akkerman, Neil H., 4,505,332, Cl. 166-120.000.

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Alcan International Limited: *See*—
Huni, Jean-Paul R.; Hollingshead, Ethan A.; Edgeworth, Thomas G.; Sood, Raman R.; Dewing, Ernest W.; and Rogers, Charles J., 4,505,796, Cl. 204-243.00R.

Alexander, Jeffrey C.: *See*—
Zahedi, Karim; Alexander, Jeffrey C.; and Zieve, Peter B., 4,505,723, Cl. 55-117.000.

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Lee, Chie-Ying; West, James D.; and Cole, Gerald F., 4,505,697, Cl. 494-35.000.

Allardice, William D., Jr.: *See*—
Suzuki, Arata; and Allardice, William D., Jr., 4,506,155, Cl. 250-252.100.

Allen, Adrian S.: *See*—
Flesher, Peter; and Allen, Adrian S., 4,506,062, Cl. 526-211.000.

Allen, David W.: *See*—
Griffiths, Anthony J.; and Allen, David W., 4,505,811, Cl. 209-17.000.

Allen, Michael E.: *See*—
Hartman, Susan E.; Allen, Michael E.; and Pascoe, William E., 4,506,094, Cl. 560-118.000.

Allied Colloids Limited: *See*—
Flesher, Peter; and Allen, Adrian S., 4,506,062, Cl. 526-211.000.

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Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gordhanbhai N.; Poncha, Rustom P.; Skovrinski, Adam L.; and Lesco, James M., 4,505,786, Cl. 204-38.400.
Miller, Ronald P.; Chiles, William H.; and Masteller, Bill L., 4,506,348, Cl. 365-73.000.
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Allis-Chalmers Corporation: *See*—
Shelley, George W., Jr., 4,505,612, Cl. 405-101.000.

Allis, Robert F.: *See*—
Kingsley, William; Stoffel, James C.; Moreland, John F., Jr.; Matteson, Ronald G.; Wiggins, Douglas G.; and Allis, Robert F., 4,506,301, Cl. 358-280.000.

Allison, Robert A., to Idea Development Corporation. Apparatus for de-icing the leading edge of an airfoil section of an aircraft. 4,505,445, Cl. 244-134.00B.

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Alps Electric Co., Ltd.: *See*—
Tanabe, Yoshio, 4,506,119, Cl. 200-16.00C.

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Altissimo, Mario. Automatic washing machine for dogs and like animals. 4,505,229, Cl. 119-158.000.

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Alvarado, Jesse T.: *See*—
Doner, August K.; Brady, Lewis L.; and Alvarado, Jesse T., 4,505,334, Cl. 166-284.000.

ALZA Corporation: *See*—
Gale, Robert M.; and Urquhart, John, 4,505,703, Cl. 604-317.000.
Peery, John R.; and Eckenhoff, James B., 4,505,702, Cl. 604-209.000.

Amerace Corporation: *See*—
Heenan, Sidney A., 4,505,590, Cl. 356-445.000.

American Brands, Inc.: *See*—
Cogbill, Everett C.; and Sprinkle, Robert S., III, 4,505,282, Cl. 131-334.000.

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American Greetings Corporation: *See*—
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American Home Products Corporation: *See*—
Bagli, Jehan F., 4,505,910, Cl. 514-26.000.
McCaully, Ronald J.; and Kim, Dong H., 4,506,077, Cl. 548-402.000.

American Hospital Supply Corporation: *See*—
Wada, Takashi; Wada, Masaru; and Matsu, Toshi, 4,505,252, Cl. 126-246.000.

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Davignon, Paul A.; and Duclos, Michael G., 4,505,487, Cl. 279-1.00S.

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Barkus, Lee A., 4,505,529, Cl. 339-17.00M.
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Praria, Guy B., 4,505,032, Cl. 29-621.000.

Anan, Tatsuro: *See*—
Miwa, Hiroshi; Kaneko, Toshio; Tonouchi, Akira; and Anan, Tatsuro, 4,505,785, Cl. 204-28.000.

Anderson, Howard L.: *See*—
Long, Nathan R.; and Anderson, Howard L., 4,505,646, Cl. 417-172.000.

Anderson, Stephen P.: *See*—
Schoenberg, Jules E.; and Anderson, Stephen P., 4,506,100, Cl. 564-430.000.

Andersson, Bror A. E. Tartar removal instrument. 4,505,678, Cl. 433-143.000.

Andersson, Karl-Hugo; Karlsson, Ingemar; and Quick, Rolf, to Flakt AB. Drying plant for a material web. 4,505,053, Cl. 34-155.000.

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Anorad Corporation: *See*—
Chitayat, Anwar, 4,505,464, Cl. 269-73.000.

Anschutz, Reynold G., to Armco Inc. Cam arm centralizer. 4,505,614, Cl. 405-195.000.

Aoki, Takashi: *See*—
Nishikawa, Masao; and Aoki, Takashi, 4,505,351, Cl. 180-169.000.

Aoki, Yoshihiro. Magnet clasp. 4,505,007, Cl. 24-303.000.

Aotani, Yoshimasa: *See*—
Tamoto, Koji; Umehara, Akira; Nagano, Teruo; Iwasaki, Masayuki; and Aotani, Yoshimasa, 4,505,793, Cl. 204-159.160.

Aoyama, Shuki: *See*—
Sujaku, Takamichi; Aoyama, Shuki; and Fukasawa, Takaaki, 4,506,128, Cl. 219-10.55F.

Aoyama, Tetsuya: *See*—
Mukoyama, Yoshiyuki; Hirai, Osamu; and Aoyama, Tetsuya, 4,505,818, Cl. 210-502.100.

Apcom, Inc.: *See*—
Syler, Rodney R., 4,505,231, Cl. 122-159.000.

Apontoweil, Peter; and Krasselt, Manfred M., to Gist-Brocades N.V. Infectious bronchitis vaccine for poultry. 4,505,892, Cl. 424-89.000.

Arai, Shoji, to Matsushita Electric Industrial Co., Ltd. Thermal printing head. 4,506,272, Cl. 346-76.0PH.

Arbuckle, Donald P. Fluidic transformer apparatus with feedback. 4,505,115, Cl. 60-562.000.

Arendsen, David L.: *See*—
DeBernardis, John F.; and Arendsen, David L., 4,505,932, Cl. 514-649.000.

Arenhold, Knut. Spring clip. 4,505,010, Cl. 24-456.000.

Argoudelis, Alexander D.; Marshall, Vincent P.; and Wiley, Paul F., to Upjohn Company, The. Antibiotic 273_{a1}. 4,505,895, Cl. 424-117.000.

Ariga, Yoshio; Ishige, Yoshiki; Satoh, Shogi; Tegawa, Masao; Kinugasa, Toshiyuki; and Yamamoto, Toru, to Honda Giken Kogyo Kabushiki Kaisha. Instrument panel manufacturing system. 4,505,774, Cl. 156-499.000.

Aritomi, Mitsutoshi: *See*—
Hokamura, Sadakazu; Shinohara, Toshio; Nomura, Ryoichi; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,505,954, Cl. 427-380.000.

Arlt, Dieter: *See*—
Klein, Gerhard; Arlt, Dieter; and Braden, Rudolf, 4,505,860, Cl. 260-453.00A.

Armand, Michel B.; and El Kadiri Cherkaoui el Moursli, Fouzia, to Agence Nationale de Valorisation de la Recherche (ANVAR); and Societe Nationale Elf Aquitaine. Bis perhalogenoacyl -or sulfonyl-imides of alkali metals, their solid solutions with plastic materials and their use to the constitution of conductor elements for electrochemical generators. 4,505,997, Cl. 429-192.000.

Armco Inc.: *See*—
Anschutz, Reynold G., 4,505,614, Cl. 405-195.000.

Armstrong, Alfred, to Crathco, Inc. Beverage-dispenser valve arrangements. 4,505,409, Cl. 222-509.000.

Armstrong, Richard M. Electric immersion heater assembly having an isolated terminal box. 4,506,140, Cl. 219-315.000.

Arnoldsson, Eric: *See*—
Hedlund, Bo P. S.; and Arnoldsson, Eric, 4,505,396, Cl. 212-223.000.

Arszman, Jerrold H.: *See*—
Lilley, Jay S.; and Arszman, Jerrold H., 4,505,153, Cl. 73-117.400.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Mori, Toshihito; Yoshizaki, Hideo; and Hasegawa, Akio, 4,505,893, Cl. 424-94.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Nishio, Etsuro; and Okura, Zenichi, 4,505,564, Cl. 354-270.000.

Asano, Choichi: *See*—
Usami, Kenichi; Kirihara, Seishin; Doi, Hiroyuki; Asano, Choichi; Sukekawa, Masayuki; and Sakaguchi, Yasuhide, 4,505,232, Cl. 122-511.000.

Asano, Masamichi; and Iwahashi, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Non-volatile semiconductor memory system. 4,506,350, Cl. 365-191.000.

Asano, Seiji; Kagechika, Takashi; and Ishiguro, Minoru, to Fuji Photo Optical Co., Ltd. Shutter mechanism for camera. 4,505,568, Cl. 354-458.000.

Asche, Bernard J. Agricultural fan control system. 4,506,199, Cl. 318-313.000.

Aschwanden, Felix: *See*—
Reitmeier, Glenn A.; and Aschwanden, Felix, 4,506,175, Cl. 307-525.000.

ASEA Aktiebolag: *See*—
Adlerborn, Jan; Larker, Hans; and Nilsson, Jan, 4,505,871, Cl. 264-325.000.
Kaufmann, Herbert; and Larsson, Jan, 4,506,123, Cl. 200-83.00J.

Ashby, Bruce A.; and Lucas, Gary M., to General Electric Company. Self-bonding room temperature vulcanizable silicone compositions. 4,506,058, Cl. 524-730.000.

Ashida, Hisashi; and Suzuki, Keiichiro, to Konishiroku Photo Industry Co., Ltd. Electrostatic reproducing apparatus. 4,505,572, Cl. 355-3.00R.

Ashland Oil, Inc.: *See*—
Chang, Biau-Hung, 4,506,101, Cl. 568-454.000.

Ashley-Rollman, Charles D., to Acrotechnology Corporation. Isolation circuit. 4,506,230, Cl. 330-10.000.

Asoma, Yoshito, to Olympus Optical Co., Ltd. Microscope objective. 4,505,553, Cl. 350-414.000.

ASP International, Inc.: *See*—
Hayba, Franklin P., 4,505,335, Cl. 169-76.000.

Associated Lead Manufacturers Limited: *See*—
Pearson, Derek G., 4,505,850, Cl. 252-609.000.

Asszonyi, Csaba; Klausz, Istvan; Kmety, Istvan; Meitzen, Nandor; and Pasztor, Rezso, to Magyar Szenbanyaszati Troszt. Process and arrangement for the support of underground cavity systems by an efficient safety casing wall. 4,505,622, Cl. 405-288.000.

AT&T Bell Laboratories: *See*—
Bennett, Joseph M.; Gordon, Alan M.; Silverio, Vincent J.; and Zydney, Herbert M., 4,506,346, Cl. 364-900.000.
Berreman, Dwight W.; and Heffner, William R., 4,505,548, Cl. 350-346.000.
Green, Donald R., Jr.; and Stevens, Charles O., II, 4,506,231, Cl. 330-129.000.

Gulati, Surender K.; and Schneider, Clayton E., Jr., 4,506,165, Cl. 307-272.00A.
Montgomery, Warren A., 4,506,358, Cl. 370-60.000.
Schwarz, Alfred O., 4,506,310, Cl. 361-104.000.

AT&T Technologies, Inc.: *See—*
Burton, William H.; and Snow, William E., 4,505,035, Cl. 29-843.000.
McDonald, James S., 4,505,184, Cl. 91-39.000.

Atelier de construction Steiger S.A.: *See—*
Christinat, Pierre L.; and Frund, Louis, 4,505,135, Cl. 66-157.000.

Athale, Ravindra: *See—*
Blodgett, Jerry A.; Szu, Harold H.; Giles, C. Lee; and Athale, Ravindra, 4,505,544, Cl. 350-162.130.

Atlantic Pacific Marine Corporation: *See—*
Evans, Darrell L., 4,505,615, Cl. 405-196.000.

Atochem: *See—*
Frusta, Georges; and Prudhon, Francois, 4,505,667, Cl. 431-182.000.

Atsumi, Morihiro: *See—*
Yamaguchi, Shunzo; Fukazawa, Takeshi; and Atsumi, Morihiro, 4,505,107, Cl. 60-303.000.

Auckenthaler, Robert, to SIG Schweizerische Industrie-Gesellschaft. Method and apparatus for making a wrapper sleeve. 4,505,769, Cl. 156-217.000.

Audhya, Tapan: *See—*
Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, 4,505,853, Cl. 260-112.50R.

Audi NSU Auto Union AG.: *See—*
Hanle, Edgar; Wunderlich, Joachim; Zwickl, Johann; and Haerdl, Stefan, 4,505,511, Cl. 296-93.000.

Auracher, Franz; Buerk, Hermann; Keil, Rudolf; Stockmann, Michael; Weingand, Kaspar; and Zeitler, Karl-Heinz, to Siemens Aktiengesellschaft. Optical device or switch for controlling radiation conducted in an optical waveguide. 4,505,539, Cl. 350-96.150.

Australasian Training Aids (Pty.) Ltd.: *See—*
Knight, Lindsay C., 4,505,481, Cl. 273-348.100.

Autenrieth, Kim A.: *See—*
DiBiano, Robert J.; Autenrieth, Kim A.; and Hales, Gary W., 4,505,668, Cl. 431-202.000.

AVA International Corporation: *See—*
Akkerman, Neil H., 4,505,331, Cl. 166-117.500.
Mills, Aubrey C.; and Akkerman, Neil H., 4,505,332, Cl. 166-120.000.

Axelson, Inc.: *See—*
Bruton, Billy R., 4,505,291, Cl. 137-77.000.

Azuma, Toru: *See—*
Hada, Kazunari; Fujii, Norio; Kawahara, Atsushi; Azuma, Toru; and Hazama, Junji, 4,506,382, Cl. 382-27.000.

B. V. Arenco P.M.B.: *See—*
Boogers, Wilhelmus P. L., 4,505,281, Cl. 131-105.000.

Baab, Heribert, to Metallgesellschaft Aktiengesellschaft. Wet-process dust-collecting apparatus especially for converter exhaust gases. 4,505,724, Cl. 55-118.000.

Baba, Susumu, to Murata Kikai Kabushiki Kaisha. Yarn splicing apparatus for spun yarns. 4,505,098, Cl. 57-22.000.

Baba, Takashi: *See—*
Yoshida, Kokichi; Niinobe, Takao; and Baba, Takashi, 4,505,788, Cl. 204-74.000.

Babcock-Hitachi Kabushiki Kaisha: *See—*
Usami, Kenichi; Kirihara, Seishin; Doi, Hiroyuki; Asano, Choichi; Sukekawa, Masayuki; and Sakaguchi, Yasuhide, 4,505,232, Cl. 122-511.000.

Baer, Stephen C., to Zomeworks Corporation. Summer/winter solar control system. 4,505,255, Cl. 126-419.000.

Bagaric, Stjepan; and Pietsch, Gunter, to Heede International Ltd. Crane anti-skewing device. 4,505,207, Cl. 105-163.0SK.

Bagli, Jehan F., to American Home Products Corporation. Aminopyrimidine derivatives, compositions and use. 4,505,910, Cl. 514-26.000.

Baglione, Richard A. Super-heat monitoring and control device for air conditioning refrigeration systems. 4,505,125, Cl. 62-209.000.

Baier, Heinrich; Waschulewski, Hans-Georg; and Kurten, Hans-Werner, to Losenhausen Maschinenbau AG. Operator's seat and controls arrangement for a tandem road roller. 4,505,356, Cl. 180-322.000.

Bailey, Terry R., to Minnesota Mining and Manufacturing Company. High-angularity retroreflective sheeting and method for manufacture. 4,505,967, Cl. 428-164.000.

Baker Perkins Holdings PLC: *See—*
Johnson, Reginald F., 4,505,093, Cl. 53-531.000.

Balanovsky, Lev; and Brauner, Arne H., to International Paper Company. Non-round liquid-tight paper board container. 4,505,423, Cl. 229-5.500.

Balasubramanian N., to Digital Optics Corporation. Braked gravity transport for laser reading and writing systems. 4,505,578, Cl. 355-43.000.

Baldwin, John J.: *See—*
Huff, Joel R.; Saari, Walfred S.; and Baldwin, John J., 4,505,918, Cl. 514-341.000.
Huff, Joel R.; Saari, Walfred S.; and Baldwin, John J., 4,506,074, Cl. 546-278.000.

Balfe, James W. Automatic indexing chuck. 4,505,488, Cl. 279-5.000.

Baliga, Bantval J., to General Electric Company. Normally-off semiconductor device with low on resistance and circuit analogue. 4,506,282, Cl. 357-43.000.

Ball, John: *See—*
Nelson, Steve; Reynolds, Frank; Roos, George E.; and Ball, John, 4,505,179, Cl. 89-1.00G.

Ballast-Nedam Groep N.V.: *See—*
Tjebbes, Johannes C.; and Wolters, Tjako A., 4,505,214, Cl. 114-29.000.

Balle, Gerhard; Rasshofer, Werner; and Schoberth, Winfried, to Bayer Aktiengesellschaft. Process for the production of polymer-containing aromatic polyether polyamines. 4,506,039, Cl. 521-137.000.

Ballereau, Jean: *See—*
de la Pintiere, Louis; and Ballereau, Jean, 4,505,323, Cl. 165-11.00A.

Balli, Heinz; Gunzenhauser, Sigmund; Fletcher, Ian J.; and Bedekovic, Davor, to Ciba-Geigy Corporation. Chromenoazaindolizine compounds. 4,506,073, Cl. 546-64.000.

Bally Manufacturing Corporation: *See—*
Nicolaus, Frank G., 4,505,167, Cl. 74-577.00R.

Balmer, Oskar: *See—*
Focke, Heinz; and Balmer, Oskar, 4,505,385, Cl. 206-260.000.

Bammert, Hubert: *See—*
Schurle, Hermann; Grimm, Wolfgang; and Bammert, Hubert, 4,505,683, Cl. 434-365.000.

Band, Elliot I., to Stauffer Chemical Company. Supported catalyst for polymerization of olefins. 4,506,029, Cl. 502-111.000.

Bank, Herbert M.; and Rubenstein, Irving H., to Maryland Cup Corporation. Apparatus for coating and flavoring ice cream cones. 4,505,220, Cl. 118-16.000.

Barbe, Pierre L.; and Depoisson, Jean P., to Pont-A-Mousson S.A. Gate valve. 4,505,453, Cl. 251-328.000.

Barbieri, Raul; and Marianelli, Giorgio. Composable wall-clock. 4,505,596, Cl. 368-236.000.

Barbour, John J.: *See—*
Henderson, James N.; Donbar, Ken W.; Barbour, John J.; and Bell, Anthony J., 4,506,031, Cl. 502-162.000.

Bark, Marvin L.: *See—*
Tseng, Wen F.; and Bark, Marvin L., 4,505,023, Cl. 29-571.000.

Barkus, Lee A., to AMP Incorporated. Electrical connector for use between circuit boards. 4,505,529, Cl. 339-17.00M.

Barley, Geoffrey W., to UOP Inc. Suspension seats for vehicles. 4,505,513, Cl. 297-307.000.

Barmag Barmer Maschinenfabrik AG: *See—*
Schippers, Heinz; Lenk, Erich; Turk, Herbert; and Schiminski, Herbert, 4,505,436, Cl. 242-43.00A.
Schippers, Heinz; Lenk, Erich; Turk, Herbert; and Schiminski, Herbert, 4,505,437, Cl. 242-43.00A.

Barnes, David; and Bliss, Peter J., to Unisearch Limited. Method for the anaerobic degradation of organic material. 4,505,819, Cl. 210-603.000.

Barnes, Michael W.; Kristofferson, Clifford E.; and Manzara, Anthony P., to Thiokol Corporation. Low vulnerability gun propellant. 4,506,069, Cl. 528-232.000.

Barnett, George H.; and Markus, Michael V., to ICI Australia Limited. Microporous hydrophilic fluoropolymer membranes and method. 4,506,035, Cl. 521-53.000.

Barr, John D.; and Fuller, John M., to NL Industries, Inc. Drill bit. 4,505,342, Cl. 175-329.000.

Barr & Stroud Limited: *See—*
Neil, Iain A., 4,505,535, Cl. 350-1.300.

Barre, Claude, to Siemens Aktiengesellschaft. Programmable logic array in ECL technology. 4,506,363, Cl. 371-15.000.

Barringer, Anthony R.: *See—*
Loveless, Arthur J.; and Barringer, Anthony R., 4,506,225, Cl. 324-334.000.

Barringer Research Limited: *See—*
Loveless, Arthur J.; and Barringer, Anthony R., 4,506,225, Cl. 324-334.000.

Barry Wright Corporation: *See—*
Peterson, Robert R., 4,505,688, Cl. 464-111.000.

Bartell, Robert J.: *See—*
Colwell, Robert; and Bartell, Robert J., 4,505,031, Cl. 29-596.000.

Barthels, Manfred: *See—*
Gehrig, Manfred; Barthels, Manfred; and Wienges, Hans, 4,506,072, Cl. 544-274.000.

Bartl, Herbert: *See—*
Waniczek, Helmut; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Uerdingen, Walter, 4,506,045, Cl. 524-31.000.

BASF Aktiengesellschaft: *See—*
Hackenberger, Alfred; Patsch, Manfred; and Gaeng, Manfred, 4,506,089, Cl. 560-020.000.
Ihbe, Jorg; Taubenmann, Peter; Thiele, Heino; and Zettler, Hans-Dieter, 4,505,592, Cl. 366-134.000.
Plath, Peter; Rohr, Wolfgang; and Wuerzer, Bruno, 4,505,741, Cl. 71-92.000.
Weitz, Hans-Martin; Fischer, Rolf; and Paust, Joachim, 4,506,096, Cl. 560-262.000.

BASF Farben & Fasern AG: *See—*
Geist, Michael, 4,505,981, Cl. 428-418.000.

Batcho, Andrew D., to Hoffmann-La Roche Inc. 7-Nitroindoles. 4,506,078, Cl. 548-469.000.

Bateman, Charles D., to Sundstrand Data Control, Inc. Static low tire pressure detection system for aircraft. 4,506,328, Cl. 364-463.000.

Bauer, Johannes: *See—*
Dalferth, Hans H.; and Bauer, Johannes, 4,505,103, Cl. 59-85.000.

Bauer, Siegfried: *See—*
Stockburger, Hermann; and Bauer, Siegfried, 4,505,471, Cl. 271-251.000.

Baumeister, Peter; Reinehr, Dieter; and Rosenegger, Eckehard, to Ciba-Geigy Corporation. Process for producing substituted 1,11-diaminoundecanes. 4,506,099, Cl. 564-413.000.
Bausch & Lomb Incorporated: *See*—
Bridson, William D.; and Esmay, Edward N., 4,505,556, Cl. 350-532.000.
Baxter, Kenneth F., to International Paint. Anti-corrosive paint. 4,505,748, Cl. 106-14.390.
Baxter, Ronald D., to General Signal Corporation. ISFET sensor and method of manufacture. 4,505,799, Cl. 204-416.000.
Baxter Travenol Laboratories, Inc.: *See*—
Gajewski, Henry M.; and Measells, Paul, 4,505,708, Cl. 604-408.000.
Bayer Aktiengesellschaft: *See*—
Balle, Gerhard; Rasshofer, Werner; and Schoberth, Winfried, 4,506,039, Cl. 521-137.000.
Hemmerich. Heinz-Peter; Schulte-Huermann, Werner; and Dohm, Heinz, 4,506,103, Cl. 568-744.000.
Jager, Gerhard; Buchel, Karl H.; Kramer, Wolfgang; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,505,922, Cl. 514-383.000.
Klein, Gerhard; Arlt, Dieter; and Braden, Rudolf, 4,505,860, Cl. 260-453.00A.
Medem, Harald; Schreckenberg, Manfred; Dhein, Rolf; Nouvertne, Werner; and Rudolph, Hans, 4,506,066, Cl. 528-196.000.
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Uhlemann, Hans, 4,505,870, Cl. 264-206.000.
Salzburg, Herbert; Hajek, Manfred; and Meyborg, Holger, 4,506,086, Cl. 549-464.000.
Waniczek, Helmut; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Uerdingen, Walter, 4,506,045, Cl. 524-31.000.
Beatty, Harry F., to VBM Corporation. Synchronized double post fluid operated lift assembly. 4,505,455, Cl. 254-89.00H.
Beck, Andras: *See*—
Oszlar, Imre; Beck, Andras; and Mohacsi, Gabor, 4,506,130, Cl. 219-73.100.
Becker, Reinhold; and Michel, Wolfgang, to Hoechst Aktiengesellschaft. Apparatus for the production of filled tubular casings. 4,505,003, Cl. 17-41.000.
Beckman, Leo H.; and Groeneweg, Abraham. Multi-image camera. 4,505,561, Cl. 354-123.000.
Beckwith, Bruce R.: *See*—
Morris, Nicholas G.; Kingsbury, Charles M.; and Beckwith, Bruce R., 4,505,731, Cl. 65-225.000.
Becton, Dickinson and Company: *See*—
North, Howard L., Jr., 4,506,018, Cl. 436-10.000.
Bedekovic, Davor: *See*—
Balli, Heinz; Gunzenhauser, Sigmund; Fletcher, Ian J.; and Bedekovic, Davor, 4,506,073, Cl. 546-64.000.
Bedline Manufacturing Company: *See*—
Spitz, Melvin P., 4,504,987, Cl. 5-13.000.
Beecham Group Limited: *See*—
Ponsford, Roger J., 4,505,894, Cl. 424-114.000.
Beecham Group p.l.c.: *See*—
Newsome, Peter M.; Moss, Stephen F.; Beeley, Lee J.; and Burgess, Malcolm N., 4,505,926, Cl. 514-398.000.
Beeley, Lee J.: *See*—
Newsome, Peter M.; Moss, Stephen F.; Beeley, Lee J.; and Burgess, Malcolm N., 4,505,926, Cl. 514-398.000.
Beer, Gary L.: *See*—
Chemtob, Elie M.; and Beer, Gary L., 4,505,884, Cl. 423-484.000.
Beerens, Hugo; Feldmann, Hugo; Gipperich, Theodor; Kirchhoff, Hans; Kusel, Siegfried; Schlanzke, Claus G.; and Nobis, Dieter, to SMS Schloemann-Siemag Aktiengesellschaft. Approach roller feed bed for cooling beds for the retardation and transverse conveyance of product lengths. 4,505,374, Cl. 198-448.000.
Bees, George L., to Candela Corporation. Series inverter for capacitor charging. 4,506,196, Cl. 315-241.00R.
Beisel, Victor A. Sonic seed dehulling system. 4,505,196, Cl. 99-519.000.
Bekishev, Kenes K.: *See*—
Yantsen, Ivan A.; Bekishev, Kenes K.; Savchak, Orest G.; Klok, Alexandr B.; Zhanabaev, Tolgat M.; Pakshtas, Mechislav-Valentinas K.; Glotov, Boris N.; Fink, Garold K.; Timkin, Alexei F.; Zorin, Nikolai I.; and Bobylev, Leonid M., 4,505,340, Cl. 173-134.000.
Belfoure, Edward L.: *See*—
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Bell, Anthony J.: *See*—
Henderson, James N.; Donbar, Ken W.; Barbour, John J.; and Bell, Anthony J., 4,506,031, Cl. 502-162.000.
Bell & Howell Company: *See*—
Reinert, Warren; and Fallos, George, 4,505,470, Cl. 271-100.000.
Bell, James A. E.; Conard, Bruce R.; and Hope, Douglas A., to Inco Limited. Process for obtaining a composite material and composite material obtained by said process. 4,505,060, Cl. 40-27.500.
Bell Telephone Laboratories, Inc.: *See*—
Burton, William H.; and Snow, William E., 4,505,035, Cl. 29-843.000.
Bellos, Thomas J.; and Lovett, Eva G., to Petrolite Corporation. Polyalkanolamines. 4,505,839, Cl. 252-344.000.
Ben, Victor R., to Du Pont de Nemours, E. I., and Company. Antistatic composition and polyester fiber containing same. 4,506,070, Cl. 528-287.000.
Bendix Corporation, The: *See*—
Woodruff, Frank; Ferguson, John H., Jr.; and Hoffman, John R., 4,505,108, Cl. 60-327.000.
Beneteau, Charles, to Patrick S.A. Cross-country ski boots. 4,505,056, Cl. 36-117.000.
Benhase, Craig, to Dexport Tool Company, Inc. Cutting tool. 4,505,626, Cl. 408-224.000.
Bennett, Donald B.; and Esch, John W., to Sperry Corporation. Reflexive utilization of descriptors to reconstitute computer instructions which are Huffman-like encoded. 4,506,325, Cl. 364-200.000.
Bennett, James W.; Howe, Gary L.; Jaakola, Kenneth A.; and Koutavas, Samuel G., to Future Tech, Inc. Magnetically attachable electric preheater for automobile engines. 4,506,138, Cl. 219-205.000.
Bennett, Joseph M.; Gordon, Alan M.; Silverio, Vincent J.; and Zydney, Herbert M., to AT&T Bell Laboratories. Programmable cartridge telephone communication system. 4,506,346, Cl. 364-900.000.
Bennett, Robert A. Slide type cap closure. 4,505,400, Cl. 215-250.000.
Bent, Kenneth R., Jr., to Gilmore-Kramer, Inc. Inflatable seal for opening in building wall. 4,505,483, Cl. 277-34.000.
Benz & Hilgers GmbH: *See*—
Kramer, Erhardt; Moller, Dieter; and Brauer, Ralph, 4,505,311, Cl. 141-129.000.
Beregi, Laszlo; Hugon, Pierre; Duhault, Jacques; and Boulanger, Michelle, to ADIR, S.A.R.L. Sulfonylurea compounds and their use in treating diabetes. 4,505,921, Cl. 514-212.000.
Bergamo, Robert L.; Foreman, Gordon T.; Gallaro, Anthony V.; and Nagel, Judy A., to North American Philips Consumer Electronics Corp. Photographic process for applying phosphor pattern to color CRT shadow mask. 4,505,999, Cl. 430-24.000.
Berger, Jean-Luc; and Descure, Patrick, to Thomson-CSF. Device for scanning an image in successive lines, utilizing the electrical charge transfer, incorporating a line memory and a television camera incorporating such a device. 4,506,299, Cl. 358-213.000.
Bergeron, Hervin J., Jr., to Ledet, Stephen J., Jr.; and Elder, James Donald, part interest to each. Air circulation system for generally enclosed structures. 4,505,325, Cl. 165-45.000.
Bergeron, Raymond J., Jr., to University of Florida. Methods and intermediates for the preparation of spermidine, homospermidine and norspermidine. 4,505,861, Cl. 260-465.00E.
Berglund, Jan, to Wicanders AB. Screw cap with security ring. 4,505,401, Cl. 215-252.000.
Bergmans, Charles, to Clarks of England, Inc. Shoe having an improved attachment of the upper to the sole. 4,505,055, Cl. 36-18.000.
Bergstrom, Hans R.; and Johansson, Uno, to AB Samefa. Equipment for straightening deformed vehicles or vehicle parts. 4,505,145, Cl. 72-457.000.
Bernardi, Carl E.: *See*—
Ross, John P.; and Bernardi, Carl E., 4,505,015, Cl. 29-116.00R.
Berndt, Dietmar: *See*—
Neidig, Arno; Berndt, Dietmar; Wahl, Georg; and Wittmer, Mark, 4,505,418, Cl. 228-122.000.
Bernstein, Joel E., to Elorac, Ltd. Method of treating acne vulgaris and composition. 4,505,896, Cl. 424-164.000.
Bernstein, Joel E. Method and composition for treating and preventing irritation of the eyes. 4,505,909, Cl. 514-217.000.
Berreman, Dwight W.; and Heffner, William R., to AT&T Bell Laboratories. Bistable liquid crystal twist cell. 4,505,548, Cl. 350-346.000.
Berthold, Rainer; and Strietzel, Rainer, to Brown, Boveri & Cie AG. Identification card. 4,506,148, Cl. 235-380.000.
Bertholet, Raymond; and Hirsbrunner, Pierre, to Nestec S. A. Preparation of serotonine and derivatives. 4,506,080, Cl. 548-504.000.
Besser Company: *See*—
Kaschner, William C.; and Bobolts, Elroy, Jr., 4,505,630, Cl. 414-152.000.
BICC Public Limited Company: *See*—
Childs, John B.; and Fairey, Norman R., 4,505,878, Cl. 419-67.000.
Bidwell, Brian A.: *See*—
Vance, Ian A. W.; Jeffrey, Colin; Bidwell, Brian A.; Leevers, David F. A.; and Woodley, Michael J. A., 4,506,262, Cl. 340-825.440.
Biedermann, Jurgen; Etschenberg, Eugen; Friehe, Hugo; Scheef, Wolfgang; and Winkelmann, Johannes, to Nattermann & Cie GmbH. Optically active dipeptides and the use thereof as tissue dissolving and histolytic agent in human beings. 4,505,854, Cl. 260-112.50R.
Bieler, Barrie H.; and Tsang, Floris Y., to Dow Chemical Company, The. Plugging micro-leaks in multi-component, ceramic tubesheets with material leached therefrom. 4,505,995, Cl. 429-104.000.
Bielfeldt, Friedrich B., to Maschinenfabrik J. Dieffenbacher GmbH & Co. Injection press. 4,505,661, Cl. 425-190.000.
Bienvenue, Louis L.: *See*—
Meisner, John W.; Moore, Robert M.; and Bienvenue, Louis L., 4,505,644, Cl. 417-50.000.
Billings, Philip A., to Xerox Corporation. Sheet decurling mechanism. 4,505,695, Cl. 493-459.000.
Bio-Care Incorporated: *See*—
Miller, Gregory R.; and Clark, Steven G., 4,505,128, Cl. 62-272.000.
Birch, Ulrich: *See*—
Ott, Hans; Boegli, Rolf; Birch, Ulrich; Kipphan, Helmut; and Loffler, Gerhard, 4,505,589, Cl. 356-402.000.
Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gordhanbhai N.; Poncha, Rustom P.; Skovrinski, Adam L.; and Lesco, James M., to Allied Corporation. Pretreatment of plastic materials for metal plating. 4,505,786, Cl. 204-38.400.
Bishop, Charles D.; Powell, Joe R.; Stamps, Kenneth H.; and Watson, Clifford A. Automatic food frying and dispensing apparatus. 4,505,194, Cl. 99-336.000.
Bissell, Eugene R.: *See*—
Rasnick, David W.; and Bissell, Eugene R., 4,505,852, Cl. 260-112.50R.

Bitsch, Philippe, to La Telephonie Industrielle et Commerciale Telic Alcatel. Telephone set including a circuit for seizing the line without lifting the handset off the gravity switch. 4,506,112, Cl. 179-81.00R.

Bizerba-Werke Wilhelm Kraut GmbH & Co. KG: *See*—
Jetter, Hans, 4,505,345, Cl. 177-211.000.

BL Technology Limited: *See*—
Strange, Victor E., 4,505,293, Cl. 137-117.000.

Black, Ervin H. Thermal window shield. 4,505,079, Cl. 52-202.000.

Blaedel, Kenneth L., to United States of America, Energy. Flow metering valve. 4,505,287, Cl. 137-12.000.

Blevins, Daniel W.: *See*—
Adelman, Robert W.; and Blevins, Daniel W., 4,505,309, Cl. 141-97.000.

Bliss, Peter J.: *See*—
Barnes, David; and Bliss, Peter J., 4,505,819, Cl. 210-603.000.

Bloch, Samuel; Bressler, Klaus; Idler, Horst; and Kleiber, Herbert, to International Standard Electric Corporation. Facility for monitoring the level of a radio-frequency signal. 4,506,332, Cl. 364-483.000.

Blodgett, Jerry A.; Szu, Harold H.; Giles, C. Lee; and Athale, Ravindra, to United States of America, Navy. Spatial frequency multiplexed coherent optical processor for calculating generalized moments. 4,505,544, Cl. 350-162.130.

Blomback, Birger; and Okada, Masahisa, to New York Blood Center, Inc. Fibrin gel-containing filter of porous material. 4,505,817, Cl. 210-484.000.

Blomback, Birger; and Okada, Masahisa, to New York Blood Center, Inc. Process for separating substances from one another using a fibrin gel filter. 4,505,822, Cl. 210-635.000.

Blomley, Peter F., to International Standard Electric Corporation. Waveform clipping circuits. 4,506,113, Cl. 179-81.00B.

Blue Mountain Industries: *See*—
Koval, Alexander; and Whitlow, H. Donald, 4,505,338, Cl. 172-611.000.

Board of Regents, University of Texas System, The: *See*—
Jones, Richard A., 4,506,030, Cl. 502-155.000.

Bobolts, Elroy, Jr.: *See*—
Kaschner, William C.; and Bobolts, Elroy, Jr., 4,505,630, Cl. 414-152.000.

Bobylev, Leonid M.: *See*—
Yantsen, Ivan A.; Bekishev, Kenes K.; Savchak, Orest G.; Klok, Alexandr B.; Zhanabaev, Tolgat M.; Pakshtas, Mechislav-Valentinas K.; Glotov, Boris N.; Fink, Garold K.; Timkin, Alexei F.; Zorin, Nikolai I.; and Bobylev, Leonid M., 4,505,340, Cl. 173-134.000.

Boden, Richard M.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,506,104, Cl. 568-820.000.

Bodysonic Kabushiki Kaisha: *See*—
Komatsu, Akira, 4,506,379, Cl. 381-46.000.

Boegli, Rolf: *See*—
Ott, Hans; Boegli, Rolf; Birch, Ulrich; Kipphan, Helmut; and Loffler, Gerhard, 4,505,589, Cl. 356-402.000.

Boehland, Burnell G.; and Coutts, Donald G., to Speedy Automatic Chimney Sweep, Inc. Chimney cleaning apparatus. 4,505,000, Cl. 15-249.000.

Boehm, Paul C.; Mortimer, John H.; Rowan, Henry M.; and Turner, Robert C., to Inductotherm Industries Inc. Multiple zone induction coil power control apparatus and method. 4,506,131, Cl. 219-10.770.

Boehringer Ingelheim KG: *See*—
Kummer, Werner; Koppe, Herbert; Stahle, Helmut; Reichl, Richard; and Kuhn, Franz J., 4,505,912, Cl. 514-236.000.

Bogert, Warren D.; Kiss, Marvin L.; and Yee, Gin W., to International Telephone and Telegraph Corporation. Frequency translator. 4,506,264, Cl. 343-18.00E.

Bohm, Peter: *See*—
Weiler, Rolf; and Bohm, Peter, 4,505,116, Cl. 60-562.000.

Bohr, Mark T.; Yu, Ken K.; Yau, Leo D.; and Garg, Shyam G., to Intel Corporation. CMOS Process for fabricating integrated circuits, particularly dynamic memory cells. 4,505,026, Cl. 29-577.00C.

Boissevain, Mathew G., to Measurex Corporation. Method of modifying a paper machine headbox slice rod assembly. 4,505,779, Cl. 162-199.000.

Bolenz, Klaus; and Liedl, Franz, to Robert Bosch GmbH. Starter for an internal combustion engine. 4,506,162, Cl. 290-38.00A.

Bolte, Steven B.: *See*—
Brewington, Grace T.; Bolte, Steven B.; Hays, Dan; and Wayman, William H., 4,505,573, Cl. 355-3.0DD.

Bolton, Gerald L.: *See*—
Weir, Donald R.; Masters, Ian M.; and Bolton, Gerald L., 4,505,744, Cl. 75-120.000.

Boncoeur, Marcel: *See*—
Dubust, Jean-Claude; Boncoeur, Marcel; and Hansz, Bernard, 4,505,945, Cl. 427-8.000.

Bonengel, Roland: *See*—
Muller, Leo; Koder, Walter; Brandenstein, Manfred; Walter, Lothar; Edelmann, Ludwig; Bonengel, Roland; and Haas, Roland, 4,505,369, Cl. 192-98.000.

Bonnet, Maurice G. Q.: *See*—
Marraud, Alain R. P.; and Bonnet, Maurice G. Q., 4,506,296, Cl. 358-88.000.

Boogers, Willelmus P. L., to B. V. Arenco P.M.B. Method and device for dividing a whole or a half a tobacco leaf into usable portions, for example, binders or wrappers. 4,505,281, Cl. 131-105.000.

Boos, Jurgen; Homersen, Achim; and Schirmag, Klaus-Peter, to Mannesmann Aktiengesellschaft. Traction device for buffering tubes. 4,505,692, Cl. 474-111.000.

Booth, Stanley H.; and Flint, John C. E., to Commercial Hydraulics Gloucester Ltd. Vehicle steering system. 4,505,168, Cl. 74-687.000.

Boothroyd, Donald C.; and Norman, Robert W., Jr., to Honeywell Information Systems Inc. Data alignment circuit. 4,506,345, Cl. 364-900.000.

Bopp, Warren G., to Eaton Corporation. Viscous bypass coupling for torque converter. 4,505,365, Cl. 192-3.290.

Borchert, Wendall: *See*—
Hoh, Thomas G.; Friedman, Bernard L.; Borchert, Wendall; and Nixon, Eugene H., Jr., 4,505,162, Cl. 74-41.000.

Borck, Gordan T.: *See*—
Huber, William J.; and Borck, Gordan T., 4,506,249, Cl. 337-232.000.

Borden Company Limited: *See*—
Ho, Guan-Huei; and Liao, Chiang-Chang, 4,506,015, Cl. 435-175.000.

Borg-Warner Corporation: *See*—
Roberts, Richard W., 4,505,016, Cl. 29-156.50R.
Roberts, Richard W., 4,505,653, Cl. 418-23.000.

Bornslaeger, S. Richard: *See*—
Matthews, Billie J.; and Bornslaeger, S. Richard, 4,505,705, Cl. 604-385.000.

Borsig GmbH: *See*—
Malewski, Werner; and Holldorff, Gunther, 4,505,133, Cl. 62-476.000.

Boswell, George A., Jr.; and Cocuzza, Anthony J., to Du Pont de Nemours, E. I., and Company. Cyclobutanone antibacterials. 4,505,905, Cl. 514-150.000.

Bottomley, Paul A.; and Edelstein, William A., to General Electric Company. Method for performing two-dimensional and three-dimensional chemical shift imaging. 4,506,223, Cl. 324-309.000.

Boulanger, Michelle: *See*—
Beregi, Laszlo; Hugon, Pierre; Duhault, Jacques; and Boulanger, Michelle, 4,505,921, Cl. 514-212.000.

Bowden, Wade R., Jr.; and Herzfeld, David, to Slater Electric, Inc. Weatherproof electrical receptacle cover. 4,505,403, Cl. 220-242.000.

Bowers, Russell E.; and Trieber, Fritz F., to Hobart Corporation. Package sensing/film control system for film wrapping machine. 4,505,092, Cl. 53-504.000.

Boxall, Stanley S. Insulated cabinet. 4,505,131, Cl. 62-407.000.

Braden, Rudolf: *See*—
Klein, Gerhard; Arlt, Dieter; and Braden, Rudolf, 4,505,860, Cl. 260-453.00A.

Bradfield, Ganey W.; and Cragin, Glynn P., Jr., to General Dynamics Corporation. Propulsion system for a V/STOL airplane. 4,505,443, Cl. 244-12.500.

Brady, D. Ward; and Chapman, James F., to Honeywell Inc. Frangible ballast. 4,505,203, Cl. 102-382.000.

Brady, Lewis L.: *See*—
Doner, August K.; Brady, Lewis L.; and Alvarado, Jesse T., 4,505,334, Cl. 166-284.000.

Bragin, Boris F.; Korotkikh, Jury B.; Markuntovich, Felix D.; and Olofinsky, Evgeny P. Gate valve. 4,505,452, Cl. 251-326.000.

Brandenstein, Manfred: *See*—
Muller, Leo; Koder, Walter; Brandenstein, Manfred; Walter, Lothar; Edelmann, Ludwig; Bonengel, Roland; and Haas, Roland, 4,505,369, Cl. 192-98.000.

Brandes, Wilhelm: *See*—
Jager, Gerhard; Buchel, Karl H.; Kramer, Wolfgang; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,505,922, Cl. 514-383.000.

Brandsaeter, Helge; and Eimstad, Olav, to Geophysical Company of Norway A/S. Method for use in marine seismic data gathering. 4,506,352, Cl. 367-21.000.

Brasie, William C.: *See*—
Wozniak, Leonard J.; and Brasie, William C., 4,505,816, Cl. 210-439.000.

Brauer, Ralph: *See*—
Kramer, Erhardt; Moller, Dieter; and Brauer, Ralph, 4,505,311, Cl. 141-129.000.

Braun, Karl; and Fetzer, Jurgen, to Intermedicat GmbH. Surgical staple. 4,505,273, Cl. 128-335.000.

Brauner, Arne H.: *See*—
Balanovsky, Lev; and Brauner, Arne H., 4,505,423, Cl. 229-5.500.

Brennan, Michael E.; and Speranza, George P., to Texaco Inc. Aromatic polyols made from polyethylene terephthalate scrap, glycols and aromatic carbonyl-containing compounds. 4,506,090, Cl. 560-91.000.

Bressler, Klaus: *See*—
Bloch, Samuel; Bressler, Klaus; Idler, Horst; and Kleiber, Herbert, 4,506,332, Cl. 364-483.000.

Brethorst, David L.: *See*—
Huang, Min N.; and Brethorst, David L., 4,505,205, Cl. 104-139.000.

Brewington, Grace T.; Bolte, Steven B.; Hays, Dan; and Wayman, William H., to Xerox Corporation. Toner charging apparatus containing wear resistant coatings. 4,505,573, Cl. 355-3.0DD.

Bridges, Robert E., to 501 Loomhurst Limited. Condensate drain valves. 4,505,427, Cl. 236-54.000.

Bridgestone Tire Company Limited: *See*—
Dan, Takuya; Watanabe, Isao; and Kurata, Tomoyuki, 4,505,462, Cl. 267-140.200.

Bridson, William D.; and Esmay, Edward N., to Bausch & Lomb Incorporated. Rotatable specimen mount for optical fiber microscopes. 4,505,556, Cl. 350-532.000.

Briere, Pierre, to Thomson-CSF. Junction vertical field effect transistor and process for the production thereof. 4,505,022, Cl. 29-571.000.

Bristol-Myers Company: *See—*
Sheinaus, Harold; and Marcus, Arnold D., 4,505,862, Cl. 260-501.180.

Bristowe, William W.; and Ford, Ernest C., Jr., to ICI Americas Inc. Carboxy modified vinyl ester urethane resins. 4,506,055, Cl. 525-424.000.

British Gas Corporation: *See—*
Streatfield, Roy; and Wilson, Francis D., 4,505,302, Cl. 138-97.000.

Broberg, David E.: *See—*
Gabor, Thomas; Broberg, David E.; Diersen, Gunther H.; and Rowenhorst, Donley D., 4,505,720, Cl. 51-295.000.

Brocklehurst, Charles E., to Opelika Manufacturing Corporation. Label dispenser with suction hold and fork member release. 4,505,467, Cl. 270-53.000.

Brodrene Gram A/S: *See—*
Gram, Klaus, 4,505,121, Cl. 62-60.000.

Broker, Klaus-Dieter, to Westfalia Separator. Self-emptying centrifuge drum. 4,505,698, Cl. 494-40.000.

Brooks, Christopher G.: *See—*
Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., 4,505,495, Cl. 280-651.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Hasegawa, Yuzo; and Shimoda, Naokazu, 4,505,605, Cl. 400-208.000.

Brown, Bobby G.: *See—*
Klesius, Phillip H.; and Brown, Bobby G., 4,505,277, Cl. 128-769.000.

Brown, Boveri & Cie AG: *See—*
Berthold, Rainer; and Strietzel, Rainer, 4,506,148, Cl. 235-380.000.
Hasenauer, Dieter; and Reiss, Harald, 4,505,977, Cl. 428-363.000.
Neidig, Arno; Berndt, Dietmar; Wahl, Georg; and Wittmer, Mark, 4,505,418, Cl. 228-122.000.

Brown Boveri Electric Inc.: *See—*
Gray, Keith I.; and Meier, Henry G., 4,506,110, Cl. 174-144.000.

Brown, Carl R.: *See—*
Mueller, Leonard E., 4,505,346, Cl. 180-7.400.

Brown, Fred A.; and Grouse, Alan F., to Rotron Incorporated. Condition sensing arrangement for ac machines. 4,506,218, Cl. 324-158.0MG.

Brown, Phil. Sweeping machine with arcuate paddle of flexible material. 4,505,096, Cl. 56-328.00R.

Brummer, Francis A.: *See—*
Hartke, Charles A.; and Brummer, Francis A., 4,505,227, Cl. 119-52.00R.

Brunner, Gerd; Hoffmann, Rainer; and Kunstle, Konrad, to Kraftwerk Union Aktiengesellschaft. Method of extracting hydrocarbons from oil-containing rock or sand through hydrogenating low temperature carbonization. 4,505,808, Cl. 208-11.00R.

Brunner, Gerd; Hoffmann, Rainer; and Kunstle, Konrad, to Kraftwerk Union Aktiengesellschaft. Process and apparatus for extracting hydrocarbons from oil shale. 4,505,809, Cl. 208-11.00R.

Bruns, Romaine R.; and Gross, Jerome, to Massachusetts General Hospital. Transparent non-fibrilized collagen material by ultracentrifugation. 4,505,855, Cl. 260-123.700.

Bruton, Billy R., to Axelson, Inc. Heat sensitive fire safe valve energy assist device. 4,505,291, Cl. 137-77.000.

Buchel, Karl H.: *See—*
Jager, Gerhard; Buchel, Karl H.; Kramer, Wolfgang; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,505,922, Cl. 514-383.000.

Buchmeyer, Sam K.: *See—*
Dumas, Ted A.; Vet, Maarten; and Buchmeyer, Sam K., 4,506,265, Cl. 343-704.000.

Buckman Laboratories, Inc.: *See—*
Fenyes, Joseph G.; and Pera, John D., 4,505,831, Cl. 252-34.000.
Fenyes, Joseph G.; and Pera, John D., 4,506,081, Cl. 548-523.000.

Budecker, Ludwig: *See—*
Burgdorf, Jochen; and Budecker, Ludwig, 4,505,652, Cl. 417-462.000.

Buerk, Hermann: *See—*
Auracher, Franz; Buerk, Hermann; Keil, Rudolf; Stockmann, Michael; Weingand, Kaspar; and Zeitler, Karl-Heinz, 4,505,539, Cl. 350-96.150.

Bugle, Robert C.: *See—*
Plummer, Mark A.; and Bugle, Robert C., 4,505,810, Cl. 208-108.000.

Buhler, Ulrich; Ribka, Joachim; Tappe, Horst; and Roth, Kurt, to Cassella Aktiengesellschaft. Azo dyestuff dischargeable to white. 4,505,856, Cl. 534-753.000.

Buhr, Gerhard: *See—*
Ruckert, Hans; Buhr, Gerhard; and Steppan, Hartmut, 4,506,003, Cl. 430-270.000.

Bukoschek, Romuald L.; and Steiner, Peter, to U.S. Philips Corporation. Return stop for a self-starting synchronous motor. 4,506,178, Cl. 310-41.000.

Bullmerwerk Karl Bullmer: *See—*
Buss, Albert, 4,505,466, Cl. 270-31.000.

Burgdorf, Jochen; and Budecker, Ludwig, to ITT Industries, Inc. Spherical piston pump. 4,505,652, Cl. 417-462.000.

Burgess, Malcolm N.: *See—*
Newsome, Peter M.; Moss, Stephen F.; Beeley, Lee J.; and Burgess, Malcolm N., 4,505,926, Cl. 514-398.000.

Burgin, Kenneth N., to U.S. Philips Corporation. Telephone circuit. 4,506,114, Cl. 179-81.00A.

Burgio di Aragona, Antonio, to Fiat Auto S.p.A. Reciprocating piston engine with swash plate mechanism. 4,505,187, Cl. 92-31.000.

Burk, Paul O., to Optical Radiation Corporation. Aspheric intraocular lens. 4,504,982, Cl. 3-13.000.

Burke, John F.: *See—*
Yannas, Ioannis V.; and Burke, John F., 4,505,266, Cl. 128-1.00R.

Burker, Ulf: *See—*
Schwabe, Ulrich; Neppl, Franz; Burker, Ulf; and Christoph, Werner, 4,505,027, Cl. 29-577.00C.

Burns, John W. Two-stage toilet flush valve assembly. 4,504,984, Cl. 4-326.000.

Burroughs Corporation: *See—*
Yum, Daniel, 4,506,173, Cl. 307-466.000.

Burton, James S.: *See—*
Marks, Robert E.; Burton, James S.; Elvidge, John A.; and Shah, Saresh, 4,505,898, Cl. 514-18.000.

Burton, William H.; and Snow, William E., to AT&T Technologies, Inc.; and Bell Telephone Laboratories, Inc. Methods of aligning and mounting a plurality of electrical leads to a plurality of terminals. 4,505,035, Cl. 29-843.000.

Burzminski, Michael J., to General Electric Company. Detecting stoichiometric end point in aromatic polycarbonate resin preparation. 4,506,067, Cl. 528-196.000.

Bush, Clarence C., deceased (by Bush, Florence F., administratrix), to United States of America, Army. Dynamic seal. 4,505,200, Cl. 102-293.000.

Bush, Florence F., administratrix: *See—*
Bush, Clarence C., deceased, 4,505,200, Cl. 102-293.000.

Bush, Rodney D.; and Robbins, Medford D., to Procter & Gamble Company, The. Agents for preparing cross-linked polymers and paint and plastic compositions containing those agents. 4,506,048, Cl. 524-100.000.

Buss, Albert, to Bullmerwerk Karl Bullmer. Cloth-laying machines. 4,505,466, Cl. 270-31.000.

Butcher, Dayton M. Security hand band. 4,504,980, Cl. 2-160.000.

Butler, Edwin G.; and Szweda, Andrew, to Lucas Industries. Methods of forming ceramic materials and ceramic products, and ceramic materials and ceramic products formed thereby. 4,506,020, Cl. 501-97.000.

Butler, L. Dennis, to Sperry Corporation. Overruning sprocket for bale wagon pickup. 4,505,633, Cl. 414-528.000.

Butler, Susannah M.: *See—*
Vukanovic, Vladimir; Butler, Susannah M.; Fazekas, George; and Miller, John R., 4,505,947, Cl. 427-34.000.

Bynum, Colonel N. Rock loading apparatus. 4,505,376, Cl. 198-520.000.

C.W. Zumbiel Co., The: *See—*
Wright, William H.; and Kruse, John M., 4,505,696, Cl. 493-130.000.

Cadwallader, Robert H.; Edmonds, Harold D.; and Kulkarni, Murlidhar V., to International Business Machines Corporation. Dual mode spectrometer test station. 4,506,158, Cl. 250-338.000.

Cameron Iron Works, Inc.: *See—*
Revere, Peter W.; and Campbell, Frank, Jr., 4,505,303, Cl. 138-149.000.

Campbell, Frank, Jr.: *See—*
Revere, Peter W.; and Campbell, Frank, Jr., 4,505,303, Cl. 138-149.000.

Campbell, Steven J.; Stickley, Keith A.; and Klingensmith, David R., to Sperry Corporation. Staggered spiral rasp bar segments for axial flow combines. 4,505,279, Cl. 130-27.00T.

Campbell, Willis R.: *See—*
Shenberger, Paul S.; Walker, James D.; and Campbell, Willis R., 4,505,197, Cl. 100-5.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
MacDonald, R. Ian; Hara, Elmer H.; and Hum, Robert H., 4,506,151, Cl. 250-213.00A.

Canadian Patents and Development Limited: *See—*
Ramachandran, Kovilvila; and Giani, Enrico, 4,505,798, Cl. 204-298.000.

Candela Corporation: *See—*
Bees, George L., 4,506,196, Cl. 315-241.00R.

Canon Denshi Kabushiki Kaisha: *See—*
Sawada, Takeshi; Yoneda, Kou; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, 4,506,220, Cl. 324-252.000.

Canon Kabushiki Kaisha: *See—*
Furuichi, Katsushi, 4,505,579, Cl. 355-55.000.
Hirohata, Michio; and Kodaira, Takanori, 4,505,567, Cl. 354-403.000.
Kanekiyo, Kazue; Kobayashi, Masatsune; Yokoyama, Yasumasa; Eida, Tsuyoshi; Komori, Tomoko; and Koike, Shoji, 4,505,749, Cl. 106-20.000.
Sawada, Takeshi; Yoneda, Kou; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, 4,506,220, Cl. 324-252.000.
Sekimura, Nobuyuki, 4,505,547, Cl. 350-339.00R.
Seto, Susumu; and Toriumi, Akihiko, 4,505,569, Cl. 355-3.00R.
Sugiura, Susumu; Sato, Tadashi; and Nakajima, Norio, 4,505,576, Cl. 355-14.00R.
Terasawa, Koji, 4,506,277, Cl. 346-140.00R.

Cantrel, James F.: *See—*
Hughes, Robert W.; and Cantrel, James F., 4,505,343, Cl. 175-409.000.

Cantrell, John L., to Ribi ImmunoChem Research, Inc. Pyridine soluble extract of a microorganism. 4,505,903, Cl. 424-195.100.

Cantrell, John L.: *See—*
Ribi, Edgar E.; and Cantrell, John L., 4,505,899, Cl. 514-8.000.
Ribi, Edgar E.; Schwartzman, Steven M.; and Cantrell, John L., 4,505,900, Cl. 514-2.000.

Capintec, Inc.: *See—*
Suzuki, Arata; and Allardice, William D., Jr., 4,506,155, Cl. 250-252.100.

Caplin, Peter B., to Energy Equipment Company Ltd., The. Fluidized bed combustion units. 4,505,230, Cl. 122-4.00D.

Caputi, Jean-Louis M.: *See—*
Quin, Rene A.; Wiet, Paul A.; and Caputi, Jean-Louis M., 4,505,295, Cl. 137-315.000.

Cardero, Silvio A., to International Business Machines Corporation. Method for detecting a fault in a data recording system read channel. 4,506,305, Cl. 360-46.000.

Cardinale, Louis J.: *See—*
Dean, Laurence C., Jr.; and Cardinale, Louis J., 4,505,654, Cl. 418-80.000.

Carithers, Charles H., Jr. Automatic mat cutting apparatus. 4,505,174, Cl. 83-455.000.

Carl-Zeiss-Stiftung: *See—*
Piller, Horst; and Kipper, Reinhold, 4,505,555, Cl. 350-527.000.
Schurle, Hermann; Grimm, Wolfgang; and Bammert, Hubert, 4,505,683, Cl. 434-365.000.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See—*
Prinz, Reinhard, 4,505,559, Cl. 354-66.000.

Carlson, Greg A. Litter-cleaning animal litter box. 4,505,226, Cl. 119-1.000.

Carlton, Lewis M.: *See—*
Murphy, Frank W., Jr.; Carlton, Lewis M.; O'Mary, Bob L.; and Cruse, Teddy H., 4,505,288, Cl. 137-59.000.

Carobbi, Renato: *See—*
Filippini, Andrea; and Carobbi, Renato, 4,506,036, Cl. 521-53.000.

Carrier Corporation: *See—*
Hannett, William J.; and Wilson, David S., 4,505,650, Cl. 417-426.000.

Carson, Don B., to UOP Inc. Heat exchanger deposit removal. 4,505,758, Cl. 134-1.000.

Carter, Dennis L.: *See—*
Fedde, Chris D.; and Carter, Dennis L., 4,506,385, Cl. 455-226.000.

Carter, Mark S.; and Ritter, Jim. Truck bed liner. 4,505,508, Cl. 296-39.00R.

Cassella Aktiengesellschaft: *See—*
Buhler, Ulrich; Ribka, Joachim; Tappe, Horst; and Roth, Kurt, 4,505,856, Cl. 534-753.000.

Cauchetier, Michel: *See—*
Angelie , Christian; Cauchetier, Michel; and Paris, Jacques, 4,505,791, Cl. 204-157.10R.

Caulfield, Henry J.: *See—*
Ludman, Jacques E.; Sampson, John L.; and Caulfield, Henry J., 4,505,588, Cl. 356-354.000.

Celanese Corporation: *See—*
Choe, Eui W.; Conciatori, Anthony B.; and Ward, Bennett C., 4,506,068, Cl. 528-207.000.
Holt, Anne; and Krutzler, James, 4,505,222, Cl. 118-304.000.
Koermer, Gerald S., 4,506,095, Cl. 560-205.000.

Censor Electronics, Inc.: *See—*
Rossi, Vince; Miller, James R.; Tetrault, Leonard P.; and Tripodi, Robert R., 4,505,426, Cl. 236-47.000.

Central Mfg., Inc.: *See—*
McLemore, Michael; and Chandler, Ronald, 4,505,380, Cl. 198-750.000.

Centre National de la Recherche Scientifique: *See—*
Marraud, Alain R. P.; and Bonnet, Maurice G. Q., 4,506,296, Cl. 358-88.000.

Cerberus AG: *See—*
Muggli, Jurg; and Guttinger, Heinz, 4,506,161, Cl. 250-574.000.

Certified Grocers of Florida, Inc.: *See—*
Jones, Robert; and Thompson, Hubert R., 4,505,126, Cl. 62-239.000.

Ceshkovsky, Ludwig: *See—*
Dakin, Wayne R.; and Ceshkovsky, Ludwig, 4,506,355, Cl. 369-32.000.

Chambley, Phillip W. Method for lubricating and conditioning monofilament fishing lines. 4,505,952, Cl. 427-155.000.

Champion International Corporation: *See—*
Cooley, James, 4,505,768, Cl. 156-153.000.

Champseix, Alain A.; Le Fur, Gerard R.; and Renault, Christian L. A., to Pharmindustrie. Method for the treatment of psychoneurotic states by administration of derivatives of 2-(4-piperidyl)-1-(4-quinolyl)-ethanone. 4,505,916, Cl. 514-314.000.

Chan, Fred N.; and Wuethrich, Ernest E., to Ford Aerospace & Communications Corporation. Apparatus for controlling the speed of a rotating body. 4,506,312, Cl. 361-240.000.

Chan, Wan-Kit: *See—*
Loev, Bernard; Chan, Wan-Kit; and Jones, Howard, 4,505,930, Cl. 514-529.000.

Chandler, Ronald: *See—*
McLemore, Michael; and Chandler, Ronald, 4,505,380, Cl. 198-750.000.

Chang, Biau-Hung, to Ashland Oil, Inc. Process for the hydroformylation of olefins to produce linear aldehydes and alcohols. 4,506,101, Cl. 568-454.000.

Chang, Chung-Hsing. Foldable cross wrench. 4,505,171, Cl. 81-177.00B.

Chang, Yu-Ting. Device for carburetting air and fuel. 4,505,864, Cl. 261-40.000.

Chapman, James F.: *See—*
Brady, D. Ward; and Chapman, James F., 4,505,203, Cl. 102-382.000.

Chappars, George S. Container for displaying and storing flat articles selectively in flattened or cylindrical form. 4,505,424, Cl. 229-87.00R.

Charboneau, Ben J.; and Zerod, Richard D., to Gulf & Western Manufacturing Company. System for detecting low liquid level and probe therefor. 4,506,258, Cl. 340-618.000.

Chartered Industries of Singapore Private Ltd.: *See—*
Sullivan, Leroy J., 4,505,182, Cl. 89-132.000.

Chase, Roger P., to United States of America, Army. Method for identifying cable conductors using two signals at different frequencies. 4,506,210, Cl. 324-66.000.

Chemische Werke Huls AG: *See—*
Aigner, Heinrich; Merget, Norbert; Norden, Jurgen; Schweppe, Manfred; and Wetter, Klaus, 4,505,732, Cl. 71-11.000.
Kaufhold, Manfred; and Takken, Hendrik J., 4,506,102, Cl. 568-667.000.
Kaufhold, Manfred, 4,506,105, Cl. 568-821.000.

Chemtob, Elie M.; and Beer, Gary L., to Occidental Research Corporation. Process for producing HF from impure phosphoric acids. 4,505,884, Cl. 423-484.000.

Chen, Huei-Mei: *See—*
Meyers, Samuel P.; and Chen, Huei-Mei, 4,505,936, Cl. 426-1.000.

Chen, Johnson C. H.; and Eichelberger, John L., to Pennwalt Corporation. Method for preparing encapsulated phase change materials. 4,505,953, Cl. 427-212.000.

Chen, Sun-Lin: *See—*
Greene, Bettye W.; and Chen, Sun-Lin, 4,506,057, Cl. 524-461.000.

Chen, Wu. Treatment method and instrumentation system. 4,505,275, Cl. 128-421.000.

Cheng, Chen-Yen; and Cheng, Sing-Wang. Vacuum freezing multiple phase transformation process and apparatus for use therein. 4,505,728, Cl. 62-542.000.

Cheng, Sing-Wang: *See—*
Cheng, Chen-Yen; and Cheng, Sing-Wang, 4,505,728, Cl. 62-542.000.

Chernoff, Edward A.; Lindtveit, Kirby M.; and Levy, Paul, to Motors & Armatures, Inc. Universally mountable motors. 4,506,179, Cl. 310-91.000.

Chevron Research Company: *See—*
Denisevich, Peter, Jr., 4,505,841, Cl. 252-500.000.
Denisevich, Peter, Jr., 4,505,844, Cl. 252-500.000.
Goodman, Jack E., 4,505,223, Cl. 118-401.000.
Kurkov, Victor P., 4,505,840, Cl. 252-500.000.
Kurkov, Victor P.; Schroeder, Albert H.; Denisevich, Peter, Jr.; and Suzuki, Shigeto, 4,505,842, Cl. 252-500.000.
Suzuki, Shigeto; Kurkov, Victor P.; Schroeder, Albert H.; and Denisevich, Peter, Jr., 4,505,843, Cl. 252-500.000.
Suzuki, Shigeto, 4,506,098, Cl. 564-305.000.

Chijiishi, Toshio; Matoba, Hiroshi; Nakamura, Kazuo; and Higuchi, Toshiaki, to Yoshida Kogyo K.K. Apparatus for manufacturing a continuous slide fastener stringer. 4,505,659, Cl. 425-121.000.

Chikaraishi, Takayo: *See—*
Utsumi, Shunji; and Chikaraishi, Takayo, 4,505,500, Cl. 292-48.000.

Childs, John B.; and Fairey, Norman R., to BICC Public Limited Company. Process for extrusion of copper. 4,505,878, Cl. 419-67.000.

Chiles, William H.: *See—*
Miller, Ronald P.; Chiles, William H.; and Masteller, Bill L., 4,506,348, Cl. 365-73.000.

Chin, Hsiao-Ling M., to Stauffer Chemical Company. Substituted amino carboxyethyl haloacetamide herbicide antidotes. 4,506,088, Cl. 560-12.000.

Chinone, Naoki; Kashiwada, Yasutoshi; Yamashita, Shigeo; and Aiki, Kunio, to Hitachi, Ltd. Semiconductor laser device. 4,506,366, Cl. 372-45.000.

Chitayat, Anwar, to Anorad Corporation. High precision workpiece positioning table. 4,505,464, Cl. 269-73.000.

Chiu, Herman S., to Union Carbide Corporation. Tar-depleted liquid smoke treated food casing. 4,505,939, Cl. 426-135.000.

Cho, Frederick Y.; and Williams, Dylan F., to Motorola, Inc. Compound surface acoustic wave matched filters. 4,506,239, Cl. 333-196.000.

Choe, Daniel H.: *See—*
Jacob, Adir; and Choe, Daniel H., 4,505,782, Cl. 156-643.000.

Choe, Eui W.; Conciatori, Anthony B.; and Ward, Bennett C., to Celanese Corporation. Two stage high molecular weight polybenzimidazole production with phosphorus containing catalyst. 4,506,068, Cl. 528-207.000.

Christensen, Finn: *See—*
Holden, Joseph T.; and Christensen, Finn, 4,505,684, Cl. 440-38.000.

Christinat, Pierre L.; and Frund, Louis, to Atelier de construction Steiger S.A. Safety device for a knitting machine. 4,505,135, Cl. 66-157.000.

Christoph, Werner: *See—*
Schwabe, Ulrich; Neppl, Franz; Burker, Ulf; and Christoph, Werner, 4,505,027, Cl. 29-577.00C.

Christopher, Glenn B.: *See—*
Regalbuto, John A.; Christopher, Glenn B.; and Motley, Jerry D., 4,505,018, Cl. 29-432.000.

Chu. Kagaku Co., Ltd.: *See—*
Suzuki, Shigemasa; and Takai, Toshiyuki, 4,506,037, Cl. 521-82.000.

Ciba-Geigy Corporation: *See—*
Balli, Heinz; Gunzenhauser, Sigmund; Fletcher, Ian J.; and Bedekovic, Davor, 4,506,073, Cl. 546-64.000.

Baumeister, Peter; Reinehr, Dieter; and Rosenegger, Eckehard, 4,506,099, Cl. 564-413.000.
Ehrenfreund, Josef, 4,505,931, Cl. 514-594.000.
Ferrini, Pier G.; Rossi, Alberto; and Haas, Georges, 4,505,913, Cl. 514-183.000.
Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,505,742, Cl. 71-93.000.
Gsell, Laurenz, 4,505,738, Cl. 71-88.000.
Kuster, Kaspar, 4,505,375, Cl. 198-482.000.
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,505,794, Cl. 204-159.240.
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,506,083, Cl. 549-27.000.
Mayer, Carl W., 4,505,858, Cl. 260-239.00R.
Ruegg, Christoph; and Voirol, Peter, 4,505,979, Cl. 428-379.000.
Schurter, Rolf; and Rempfler, Hermann, 4,505,743, Cl. 71-94.000.

Cincinnati Milacron Inc.: *See*—
Hesford, Frank W.; Lampe, Jerome L.; and Szekely, Paul, 4,506,144, Cl. 219-497.000.
Magnuson, Timothy J., 4,506,335, Cl. 364-513.000.

Circello, Joseph C.; Howell, Thomas H.; and Edgington, Gregory C., to Honeywell Information Systems Inc. Method and apparatus for producing the residue of the product of two residues. 4,506,340, Cl. 364-746.000.

Citizen Watch Co. Ltd.: *See*—
Kawahara, Hisashi; Kihara, Hiroyuki; and Sase, Masahiro, 4,505,594, Cl. 368-73.000.

Clark, Russell L.; and Nestell, David E., to Prince Corporation. Magnetic sensor mounting system. 4,505,054, Cl. 33-357.000.

Clark, Steven G.: *See*—
Miller, Gregory R.; and Clark, Steven G., 4,505,128, Cl. 62-272.000.

Clarke, Raymond, to Raychem Corporation. Thermostatic fiber optic waveguides. 4,505,542, Cl. 350-96.330.

Clarks of England, Inc.: *See*—
Bergmans, Charles, 4,505,055, Cl. 36-18.000.

Claudius Peters AG: *See*—
Osterode, Ulrich, 4,505,292, Cl. 137-240.000.

Claussen, Nils; and Petzow, Gunter, to Max-Planck-Institut zur Foerderung der Wissenschaften e.V. Ceramic formed body with a high crack arrestability. 4,506,024, Cl. 501-105.000.

Cline, Jay D., to Dayton-Granger, Inc. Lightning diverter strip with diamond-shaped conducting segments. 4,506,311, Cl. 361-218.000.

Clipp, James L.; and Stephens, Charles E., to Clipp, James L. Window blind. 4,505,070, Cl. 49-83.000.

Cloke, Robert L., to Sperry Corporation. Composite filter/differentiator. 4,506,236, Cl. 333-19.000.

Cobbs, Walter H., Jr.; and Rehman, William R., to Nordson Corporation. Method and apparatus for dispensing liquid compositions. 4,505,406, Cl. 222-135.000.

Cobbs, Walter H., Jr.; and Rehman, William R., to Nordson Corporation. Coating by atomization of high (i.e., about 70–99% by weight) solids film-forming compositions. 4,505,957, Cl. 427-422.000.

Cocuzza, Anthony J.: *See*—
Boswell, George A., Jr.; and Cocuzza, Anthony J., 4,505,905, Cl. 514-150.000.

Cody, Charles A.; Reichert, William W.; Kemnetz, Steven J.; and Magauran, Edward D., to NL Industries, Inc. Process for preparing high quality titanium dioxide. 4,505,886, Cl. 423-616.000.

Coe, Ronald J., to SCI Systems, Inc. Time card recorder and method for identifying employee work schedule. 4,506,274, Cl. 346-82.000.

Cogbill, Everett C.; and Sprinkle, Robert S., III, to American Brands, Inc. Innerliner wrap for smoking articles. 4,505,282, Cl. 131-334.000.

Cohn, Martin: *See*—
Jacoby, George V.; and Cohn, Martin, 4,506,252, Cl. 340-347.0DD.

Cole, Gerald F.: *See*—
Lee, Chie-Ying; West, James D.; and Cole, Gerald F., 4,505,697, Cl. 494-35.000.

Cole, William A., to Linear Technology Inc. Peak amplitude detector. 4,506,169, Cl. 307-351.000.

Coleman, Ernest W. Storm warning method and apparatus. 4,506,211, Cl. 324-72.000.

Colgate-Palmolive Company: *See*—
Erpicum, Emile; and Dehan, Louis, 4,505,706, Cl. 604-389.000.

Coller, Dana L.: *See*—
Hodgkins, Charles E.; Rose, Daniel C.; and Coller, Dana L., 4,506,026, Cl. 501-135.000.

Collins, Donald A., to NCR Corporation. Error correction system. 4,506,365, Cl. 371-38.000.

Collins, Earl R. Implantable fluid dispensing system. 4,505,710, Cl. 604-891.000.

Colwell, Robert; and Bartell, Robert J., to Universal Electric Company. Method of assembling an electric motor. 4,505,031, Cl. 29-596.000.

Combustion Engineering Co., Inc.: *See*—
Warren, Douglas H.; and Wentzell, Timothy H., 4,505,874, Cl. 376-249.000.

Combustion Engineering, Inc.: *See*—
Hellewell, Todd D., 4,505,435, Cl. 241-79.100.
Schukei, Glen E., 4,505,017, Cl. 29-157.30R.

Comfort Auto Industries, Inc.: *See*—
Richards, William D., 4,505,139, Cl. 70-221.000.

Commercial Hydraulics Gloucester Ltd.: *See*—
Booth, Stanley H.; and Flint, John C. E., 4,505,168, Cl. 74-687.000.

Commissariat a l'Energie Atomigue: *See*—
Angelie , Christian; Cauchetier, Michel; and Paris, Jacques, 4,505,791, Cl. 204-157.10R.

Commissariat a l'Energie Atomique: *See*—
Dubust, Jean-Claude; Boncoeur, Marcel; and Hansz, Bernard, 4,505,945, Cl. 427-8.000.
Jeuch, Pierre, 4,505,030, Cl. 29-591.000.
Nguyen-Thanh, Thong, 4,505,329, Cl. 165-81.000.
Rion, Jacky, 4,505,877, Cl. 376-352.000.

Compagnie Francaise Des Petroles: *See*—
Quin, Rene A.; Wiet, Paul A.; and Caputi, Jean-Louis M., 4,505,295, Cl. 137-315.000.

Computervision Corporation: *See*—
Mansell, Barry N.; and Friedman, David, 4,506,298, Cl. 358-160.000.

Comstock, Robert H.; Curtiss, William P.; and Fulton, Donald E., to IMEC Corporation. Motion control system with adaptive deceleration. 4,506,321, Cl. 364-174.000.

Conard, Bruce R.: *See*—
Bell, James A. E.; Conard, Bruce R.; and Hope, Douglas A., 4,505,060, Cl. 40-27.500.

Concast Service Union AG: *See*—
Zeller, Josef, 4,505,321, Cl. 164-491.000.

Conciatori, Anthony B.: *See*—
Choe, Eui W.; Conciatori, Anthony B.; and Ward, Bennett C., 4,506,068, Cl. 528-207.000.

Considine, Robert J.; Schirtzinger, Joseph F.; and Stiles, Kenneth M., to Sea-Log Corporation. Rodent-resistant non-conductive optical fiber cable. 4,505,541, Cl. 350-96.230.

Continental Disc Corporation: *See*—
Wilson, Bryce H., 4,505,289, Cl. 137-68.00R.

Cook, Harold T., Jr., to Marine Construction & Design Co. Longline hauling and stowage apparatus. 4,505,062, Cl. 43-6.500.

Cooley, James, to Champion International Corporation. Method of making a decorative heat resistant laminate. 4,505,768, Cl. 156-153.000.

Cooper Industries, Inc.: *See*—
Peterson, Brian P.; and Murphy, Patrick J., 4,506,121, Cl. 200-50.00B.

Cooper, Kevin; Richardson, Kenneth; and Whittle, Peter J., to Pfizer Inc. Antifungal S-arylmethyl- and S-heterocyclylmethyl ethers of 2-aryl-3-mercapto-1-(1H-1,2,4-triazol-1-yl) propan-2-ols. 4,505,919, Cl. 514-340.000.

CooperBiomedical, Inc.: *See*—
Nix, Paul T.; Goldfarb, Rebecca D.; Stong, Linda J.; Sulick, Lorraine E.; Trivedi, Ramesh C.; and Morgenstern, Stanley W., 4,505,756, Cl. 127-29.000.

Coots, William P.: *See*—
Joannou, Kyriacos; and Coots, William P., 4,506,309, Cl. 360-137.000.

Corley, Quentin D., Jr. Vehicle cargo elevator with upright storage. 4,505,359, Cl. 187-9.00R.

Cormat, Inc.: *See*—
Pedrotte, Charles E., 4,504,999, Cl. 15-230.100.

Cornell, David D.: *See*—
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,506,092, Cl. 560-103.000.

Cosyns, Jean: *See*—
Deschamps, Andre ; Cosyns, Jean; Le Page, Jean-Francois; and Hotier, Gerard, 4,505,880, Cl. 423-219.000.

Cotton Incorporated: *See*—
Turner, John D., 4,505,944, Cl. 427-8.000.
Warner, Lee A.; and Fewin, Fred A., Jr., 4,505,631, Cl. 414-359.000.

Coughlin, Charles P., to International Business Machines Corporation. Modular test probe. 4,506,215, Cl. 324-158.00P.

Coulter, John P. Fluid applicator for treating garments. 4,505,410, Cl. 222-611.000.

Courtaulds PLC: *See*—
Scales, John T.; Poole, Anthony G.; Wilson, David; and Middleton, Anthony J., 4,504,990, Cl. 5-459.000.

Coutts, Donald G.: *See*—
Boehland, Burnell G.; and Coutts, Donald G., 4,505,000, Cl. 15-249.000.

Cowan, Jack C., to Venture Chemicals, Inc. Foundry mold and core sands. 4,505,750, Cl. 106-38.350.

Cox, Roger B.; and Steer, David C., to Lever Brothers Company. Microbial heteropolysaccharide. 4,506,044, Cl. 524-27.000.

Coy, David H.; and Murphy, William A., to Administrators of the Tulane Educational Fund, The. Cyclic pentapeptides displaying somatostatin antagonism and method of treatment of mammals therewith. 4,505,897, Cl. 514-11.000.

Cozac, Daniel; and Rogghe, Hugo, to Glaverbel. Method of reducing light reflection from glass surfaces. 4,505,781, Cl. 156-640.000.

CPC International Inc.: *See*—
Reed, William M., 4,506,012, Cl. 435-139.000.

Cragin, Glynn P., Jr.: *See*—
Bradfield, Ganey W.; and Cragin, Glynn P., Jr., 4,505,443, Cl. 244-12.500.

Craig, Walter J., to Hoover Universal, Inc. Blow molding machine. 4,505,664, Cl. 425-525.000.

Crathco, Inc.: *See*—
Armstrong, Alfred, 4,505,409, Cl. 222-509.000.

Craver, Joseph N., to Union Carbide Corporation. Multilayer films comprising mixtures of a melt index and 2 melt index linear low density polyethylene. 4,505,970, Cl. 428-213.000.

Criss, George H.: *See*—
Kleeb, Thomas R.; Criss, George H.; and McCreight, Donald O., 4,506,025, Cl. 501-124.000.

Cristiani, Athos, to Sasib S.p.A. Device for wrapping a junction band around a pair of cigarettes. 4,505,280, Cl. 131-94.000.

Cronenwett, Anna E.; and Doyle, Kathleen. Rehabilitation devices. 4,505,265, Cl. 128-1.00R.

Crosby Valve & Gage Company: *See*—
Walter, John F., 4,505,294, Cl. 137-241.000.

Cross, Gregory L.; and Cross, Wendell C. Underwater thermometer and method of making. 4,506,371, Cl. 374-136.000.

Cross, Wendell C.: *See*—
Cross, Gregory L.; and Cross, Wendell C., 4,506,371, Cl. 374-136.000.

Crossley, Roger, to John Wyeth & Brother Limited. Process for preparing 1-(3-bromo-2-alkylpropanoyl)-l-proline derivatives. 4,506,082, Cl. 548-533.000.

Crowell Corporation, The: *See*—
Adelman, Robert W.; and Blevins, Daniel W., 4,505,309, Cl. 141-97.000.

Crown Zellerbach Corporation: *See*—
Reba, Imants, 4,505,412, Cl. 225-96.000.

Cruse, Teddy H.: *See*—
Murphy, Frank W., Jr.; Carlton, Lewis M.; O'Mary, Bob L.; and Cruse, Teddy H., 4,505,288, Cl. 137-59.000.

Crystalate Electronics Limited: *See*—
Kirby, Peter L., 4,506,250, Cl. 338-5.000.

Csepel Muvek Egyedi Gepgyara: *See*—
Oszlar, Imre; Beck, Andras; and Mohacsi, Gabor, 4,506,130, Cl. 219-73.100.

Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., to Multiform Desiccants, Inc. Adsorbent cartridge. 4,505,727, Cl. 55-387.000.

Cummins Engine Company, Inc.: *See*—
Smith, Edward D., 4,505,244, Cl. 123-447.000.

Cunningham, Brian C.: *See*—
Goodman, Nelson; and Cunningham, Brian C., 4,506,010, Cl. 435-32.000.

Curtiss, William P.: *See*—
Comstock, Robert H.; Curtiss, William P.; and Fulton, Donald E., 4,506,321, Cl. 364-174.000.

Cydzik, Edward A.: *See*—
Gen, Tamar G.; and Cydzik, Edward A., 4,505,421, Cl. 228-224.000.

DACAM Corporation: *See*—
Osteen, John F., 4,505,089, Cl. 53-48.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Ishii, Taiji; and Tarutani, Takashi, 4,505,968, Cl. 428-172.000.
Kuroda, Koji; and Takeda, Hideichiro, 4,505,983, Cl. 428-423.100.
Okushita, Masataka, 4,505,694, Cl. 493-101.000.

Dai Nippon Toryo Co., Ltd.: *See*—
Hokamura, Sadakazu; Shinohara, Toshio; Nomura, Ryoichi; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,505,954, Cl. 427-380.000.

Dainippon Screen Manufacturing Co., Ltd.: *See*—
Maeda, Kiyoshi, 4,506,275, Cl. 346-108.000.

Dakin, Wayne R.; and Ceshkovsky, Ludwig, to Discovision Associates. Method and apparatus for information retrieval from an optically readable storage medium. 4,506,355, Cl. 369-32.000.

Dalferth, Hans H.; and Bauer, Johannes, to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co. Chain joint for link chains. 4,505,103, Cl. 59-85.000.

Damson, Eckart; Moser, Winfried; Muller, Klaus; Rieger, Franz; and Schubler, Rainer, to Robert Bosch GmbH. Spark plug and optical combustion sensor combination. 4,506,186, Cl. 313-129.000.

Dan, Takuya; Watanabe, Isao; and Kurata, Tomoyuki, to Bridgestone Tire Company Limited. Elastomeric shock and vibration isolator. 4,505,462, Cl. 267-140.200.

Danfoss A/S: *See*—
Nicolaisen, Holger, 4,505,533, Cl. 339-198.00R.
Thomsen, Svend E.; and Kyster, Erik, 4,505,109, Cl. 60-386.000.
von Huth Smith, Ulf M., 4,505,110, Cl. 60-384.000.

Daniel, Daniel S.: *See*—
Toner, John L.; and Daniel, Daniel S., 4,505,800, Cl. 204-418.000.

Danno, Yoshiaki; and Nakagami, Tatsuro, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for judging the state of operation of an intake passage pressure detecting device for an engine. 4,506,338, Cl. 364-551.000.

Dany, Franz-Josef: *See*—
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, 4,505,849, Cl. 252-609.000.

Dardi, Louis E.: *See*—
Smickley, Robert J.; and Dardi, Louis E., 4,505,764, Cl. 148-133.000.

Dart Industries Inc.: *See*—
Picozza, Augusto A., 4,505,506, Cl. 294-161.000.

Dasgupta, Sunil P., to Hercules Incorporated. Coating compositions. 4,505,990, Cl. 428-694.000.

Datapic Systems, Inc.: *See*—
Neuburger, Werner; and Gabor, Martin P., 4,505,061, Cl. 40-489.000.

Datwyler, Walter; and Meister, Leo, to SIG Swiss Industrial Company. Method and apparatus for operating a d.c. motor. 4,506,200, Cl. 318-493.000.

Daughton, James M., to Honeywell Inc. Circuit chip. 4,506,139, Cl. 219-209.000.

David, Paul-Johannes: *See*—
Wolters, Johannes; David, Paul-Johannes; and Heller, Monika, 4,505,875, Cl. 376-283.000.

Davies, John R.; and Rice, Glen V. Ankle splint. 4,505,269, Cl. 128-87.00R.

Davignon, Paul A.; and Duclos, Michael G., to American Optical Corporation. Dead stop for collet chucks. 4,505,487, Cl. 279-1.00S.

Day, Roger W.; and Grichar, Charles N., to Geosource Inc. Solids mixing well structure and method. 4,505,591, Cl. 366-134.000.

Dayton-Granger, Inc.: *See*—
Cline, Jay D., 4,506,311, Cl. 361-218.000.

de la Fuente, Carlos: *See*—
Dinis, Antonio; de la Fuente, Carlos; and Mondorf, Paul, 4,505,081, Cl. 52-223.00L.

de la Pintiere, Louis; and Ballereau, Jean, to Intercontrole Societe Anonyme. Apparatus for inspecting heat exchanger tubes. 4,505,323, Cl. 165-11.00A.

Dean, Laurence C., Jr.; and Cardinale, Louis J., to Vickers Incorporated. Rotary vane device with two pressure chambers for each vane. 4,505,654, Cl. 418-80.000.

Deardorff, Donald L. Removal of catalyst residues from polyesters. 4,506,091, Cl. 560-99.000.

DeBernardis, John F.; and Arendsen, David L., to Abbott Laboratories. Method of producing α_2-adrenergic receptor agonist activity. 4,505,932, Cl. 514-649.000.

De Brossard, Philippe, to Societe Civile Professionnelle Gazzano & Blais, a part interest. Swimming pool coping. 4,504,985, Cl. 4-506.000.

DEC International, Inc.: *See*—
Huang, Min N.; and Brethorst, David L., 4,505,205, Cl. 104-139.000.

Dee, Richard D.; DiGiacomo, Louis A.; and Tomosy, Geza. Apparatus and method for applying printed material to a cylindrical object. 4,505,198, Cl. 101-40.000.

Deere & Company: *See*—
Demorest, Donald W., 4,505,094, Cl. 56-10.200.

Degen, Michael F.: *See*—
Fiarman, Sidney; Degen, Michael F.; and Peters, Henry F., 4,505,218, Cl. 116-200.000.

Deguchi, Hideaki, to Kabushiki Kaisha Komatsu Seisakusho. Shear angle adjusting apparatus for shearing machine. 4,505,172, Cl. 83-74.000.

Dehan, Louis: *See*—
Erpicum, Emile; and Dehan, Louis, 4,505,706, Cl. 604-389.000.

De Hubry, Fredrik F. Illumination transmission system for format adaptation in projections. 4,505,554, Cl. 350-518.000.

Deinzer, Dietrich F. Method of forming construction panel. 4,505,019, Cl. 29-432.000.

Deland, Olivier. Internal combustion engine. 4,505,239, Cl. 123-197.0AC.

DeLigt, John; and Nikkel, Willem A., to Westvaco Corporation. Method and apparatus for wrapping paper rolls. 4,505,090, Cl. 53-137.000.

Dell, William J.; Gonsalves, Alexander A.; and Flango, William E., to General Foods Corporation. Process for making a freeze-thaw stable edible foam containing milk fat. 4,505,943, Cl. 426-565.000.

Delloye, N., to Jeumont-Schneider. Component for connecting a primary pump and a delivery pipe in a breeder reactor of the swimming-pool type. 4,505,872, Cl. 376-203.000.

DeLuca, Hector F.; Schnoes, Heinrich K.; Sicinski, Rafal R.; and Tanaka, Yoko, to Wisconsin Alumni Research Foundation. Hydroxyvitamin D_2 isomers. 4,505,906, Cl. 514-167.000.

Demeulemeester, Jean-Marc: *See*—
Demeulemeester, Jean R.; and Demeulemeester, Jean-Marc, 4,505,937, Cl. 426-8.000.

Demeulemeester, Jean R.; and Demeulemeester, Jean-Marc. Method of pasteurizing vegetables for marketing. 4,505,937, Cl. 426-8.000.

Demorest, Donald W., to Deere & Company. Row crop harvester guidance system control circuit. 4,505,094, Cl. 56-10.200.

Denisevich, Peter, Jr., to Chevron Research Company. Fused 6,6,6-membered heterocyclic electroactive polymers. 4,505,841, Cl. 252-500.000.

Denisevich, Peter, Jr., to Chevron Research Company. P-Type polyphenoxazine electroactive polymers. 4,505,844, Cl. 252-500.000.

Denisevich, Peter, Jr.: *See*—
Kurkov, Victor P.; Schroeder, Albert H.; Denisevich, Peter, Jr.; and Suzuki, Shigeto, 4,505,842, Cl. 252-500.000.
Suzuki, Shigeto; Kurkov, Victor P.; Schroeder, Albert H.; and Denisevich, Peter, Jr., 4,505,843, Cl. 252-500.000.

Dennis, Kent S.: *See*—
Rose, Gene D.; Dennis, Kent S.; and Evani, Syamalarao, 4,505,827, Cl. 252-8.55R.

Dentsply Research & Development Corp.: *See*—
Gonser, Donald I., 4,505,676, Cl. 433-119.000.

Depoisson, Jean P.: *See*—
Barbe, Pierre L.; and Depoisson, Jean P., 4,505,453, Cl. 251-328.000.

Descal-A-Matic Corporation: *See*—
Lindler, Carl, 4,505,815, Cl. 210-223.000.

Deschamps, Andre ; Cosyns, Jean; Le Page, Jean-Francois; and Hotier, Gerard, to Institut Francais du Petrole. Process for the hydrodesulfurization and deoxygenation of a gas containing oxygen and organic sulfur compounds. 4,505,880, Cl. 423-219.000.

Descure, Patrick: *See*—
Berger, Jean-Luc; and Descure, Patrick, 4,506,299, Cl. 358-213.000.

Detroit, William J., to Reed Lignin Inc. Oil well drilling clay conditioner. 4,505,825, Cl. 252-8.50C.

Dettling, Charles J.; and Terry, Peter L., to Engelhard Corporation. Integral gas seal for fuel cell gas distribution assemblies and method of fabrication. 4,505,992, Cl. 429-36.000.

Detwiler, Richard L.; Schlegel, Brooke P.; and Kissel, Thomas R., to Eastman Kodak Company. Overcoat compositions and ion-selective electrodes for ionic analyte determinations. 4,505,801, Cl. 204-418.000.
Deutchman, Gary. Patient transfer arrangement. 4,504,988, Cl. 5-81.00R.
Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Ludwig, Hubert, 4,505,507, Cl. 296-1.00S.
Dewing, Ernest W.: *See*—
Huni, Jean-Paul R.; Hollingshead, Ethan A.; Edgeworth, Thomas G.; Sood, Raman R.; Dewing, Ernest W.; and Rogers, Charles J., 4,505,796, Cl. 204-243.00R.
Dexport Tool Company, Inc.: *See*—
Benhase, Craig, 4,505,626, Cl. 408-224.000.
Dhein, Rolf: *See*—
Medem, Harald; Schreckenberg, Manfred; Dhein, Rolf; Nouvertne, Werner; and Rudolph, Hans, 4,506,066, Cl. 528-196.000.
Diamond Automations, Inc.: *See*—
Thomas, Leslie P., 4,505,373, Cl. 198-432.000.
Diamond Shamrock Chemicals Company: *See*—
Lipowski, Stanley A.; and Miskel, John J., Jr., 4,505,828, Cl. 252-8.55D.
Lipowski, Stanley A.; Miskel, John J., Jr.; and Schick, Martin J., 4,505,833, Cl. 252-8.50C.
Diaz, Zaida, to Shell Oil Company. Ammonium polysulfide removal of HCN from gaseous streams, with subsequent production of NH_3, H_2S, and CO_2. 4,505,881, Cl. 423-236.000.
DiBiano, Robert J.; Autenrieth, Kim A.; and Hales, Gary W., to Phillips Petroleum Company. Control of smoke emissions from a flare stack. 4,505,668, Cl. 431-202.000.
DiBiano, Robert J. Fractional distillation column control. 4,506,334, Cl. 364-501.000.
Dierichs, Wolfgang; Eberhardt, Werner; and Wegner, Jurgen, to Henkel Kommanditgesellschaft auf Aktien. Dehesive lining paper for wall coverings comprising a fleece laminated to a film having a low-energy surface. 4,505,964, Cl. 428-85.000.
Dierssen, Gunther H.: *See*—
Gabor, Thomas; Broberg, David E.; Dierssen, Gunther H.; and Rowenhorst, Donley D., 4,505,720, Cl. 51-295.000.
Diesel Kiki Co., Ltd.: *See*—
Inomata, Kenichi, 4,505,122, Cl. 62-133.000.
DiGiacomo, Louis A.: *See*—
Dee, Richard D.; DiGiacomo, Louis A.; and Tomosy, Geza, 4,505,198, Cl. 101-40.000.
Digital Optics Corporation: *See*—
Balasubramanian N., 4,505,578, Cl. 355-43.000.
Dinis, Antonio; de la Fuente, Carlos; and Mondorf, Paul, to Freyssinet International (STUP). Curved device for connection between two rectilinear portions of a stretched cable. 4,505,081, Cl. 52-223.00L.
Discovision Associates: *See*—
Dakin, Wayne R.; and Ceshkovsky, Ludwig, 4,506,355, Cl. 369-32.000.
Diversey Wyandotte Corporation: *See*—
Long, Nathan R.; and Anderson, Howard L., 4,505,646, Cl. 417-172.000.
Diversitech Corporation: *See*—
Turner, George S.; and Mitchell, Donald B., 4,505,449, Cl. 248-669.000.
Dlugos, Daniel F., to Pitney Bowes Inc. Electronic mailing apparatus and method. 4,506,330, Cl. 364-466.000.
Dobson Park Industries PLC: *See*—
Seddon, James; and Jones, Frank, 4,505,517, Cl. 299-31.000.
Dr. Johannes Heidenhain GmbH: *See*—
Michel, Dieter, 4,505,580, Cl. 355-53.000.
Doehnert, Donald F.; and Hill, Arthur S., to Johnson & Johnson Products, Inc. Stoma seal adhesive. 4,505,976, Cl. 428-355.000.
Dohm, Heinz: *See*—
Hemmerich, Heinz-Peter; Schulte-Huermann, Werner; and Dohm, Heinz, 4,506,103, Cl. 568-744.000.
Doi, Hiroyuki: *See*—
Usami, Kenichi; Kirihara, Seishin; Doi, Hiroyuki; Asano, Choichi; Sukekawa, Masayuki; and Sakaguchi, Yasuhide, 4,505,232, Cl. 122-511.000.
Doi, Terukazu: *See*—
Endo, Yoichi; Nakanishi, Kazuo; Namura, Hideki; Doi, Terukazu; Kusumoto, Katsunori; Shimizu, Kazuyuki; Yoshimi, Kazuhiko; Nagai, Shigeru; and Sato, Shoichi, 4,505,217, Cl. 114-103.000.
Dolak, Terence M.; and Martin, Tellis A., to Mead Johnson & Company. Isoindole diuretic derivatives, compositions and use. 4,505,911, Cl. 514-229.000.
Donbar, Ken W.: *See*—
Henderson, James N.; Donbar, Ken W.; Barbour, John J.; and Bell, Anthony J., 4,506,031, Cl. 502-162.000.
Doner, August K.; Brady, Lewis L.; and Alvarado, Jesse T., to Oil States Industries, Inc. Ball sealer. 4,505,334, Cl. 166-284.000.
Donn Incorporated: *See*—
Mieyal, David F., 4,505,083, Cl. 52-476.000.
Donovan, James P. Seaming tool for floor coverings. 4,505,039, Cl. 30-289.000.
Dorer, Casper J., Jr., to Lubrizol Corporation, The. Organo transition metal salt/ashless detergent-dispersant combinations. 4,505,718, Cl. 44-66.000.
Dorn, Peter: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; Herbstman, Sheldon; and Dorn, Peter, 4,505,835, Cl. 252-51.50A.
Doshak, John M.: *See*—
Hergenrother, William L.; and Doshak, John M., 4,506,050, Cl. 524-143.000.
Dosimeter Corporation of America: *See*—
Reuter, Frederick A.; and Moorman, Charles J., 4,506,159, Cl. 250-377.000.
Dow Chemical Company, The: *See*—
Bieler, Barrie H.; and Tsang, Floris Y., 4,505,995, Cl. 429-104.000.
Greene, Bettye W.; and Chen, Sun-Lin, 4,506,057, Cl. 524-461.000.
Hay, Robert A., II, 4,505,662, Cl. 425-329.000.
Hefner, Robert E., Jr., 4,506,063, Cl. 528-96.000.
Markley, Lowell D.; Tong, Yulan C.; and Wood, Steven G., 4,505,929, Cl. 514-520.000.
Poindexter, Graham S., 4,505,859, Cl. 260-453.00P.
Rose, Gene D.; Dennis, Kent S.; and Evani, Syamalarao, 4,505,827, Cl. 252-8.55R.
Sumner, William C., Jr.; Hoyer, Gale G.; and Kozak, William G., 4,505,885, Cl. 423-592.000.
Wozniak, Leonard J.; and Brasie, William C., 4,505,816, Cl. 210-439.000.
Dow Chemical Rheinwerk GmbH: *See*—
Rance, Robert W., 4,506,051, Cl. 524-233.000.
Dow Corning Corporation: *See*—
Meddaugh, Michael D., 4,505,955, Cl. 427-393.000.
Doyle, Kathleen: *See*—
Cronenwett, Anna E.; and Doyle, Kathleen, 4,505,265, Cl. 128-1.00R.
Dreano, Claude. Installation for cooking, defrosting and cooling of food products and in particular hams. 4,505,192, Cl. 99-330.000.
Dresser Industries, Inc.: *See*—
Kleeb, Thomas R.; Criss, George H.; and McCreight, Donald O., 4,506,025, Cl. 501-124.000.
Kramer, Lee P.; Schantz, Ronald K.; Kirkham, Steven C.; and Tschanz, Charles M., 4,505,339, Cl. 172-812.000.
Whittemore, Dwight S.; and Michael, David J., 4,506,022, Cl. 501-100.000.
Dubois, Jean-Claude: *See*—
Layotte, Pierre-Claude; Dubois, Jean-Claude; and James, Andre , 4,505,362, Cl. 188-67.000.
Dubust, Jean-Claude; Boncoeur, Marcel; and Hansz, Bernard, to Commissariat a l'Energie Atomique. Process and apparatus for coating a member by plasma spraying. 4,505,945, Cl. 427-8.000.
Duclos, Michael G.: *See*—
Davignon, Paul A.; and Duclos, Michael G., 4,505,487, Cl. 279-1.00S.
Duddy, James J. Magnetic support for flashlight. 4,506,317, Cl. 362-396.000.
Duffin, Edwin G.: *See*—
Markowitz, Harold T.; Rueter, John C.; and Duffin, Edwin G., 4,505,276, Cl. 128-697.000.
Duhault, Jacques: *See*—
Beregi, Laszlo; Hugon, Pierre; Duhault, Jacques; and Boulanger, Michelle, 4,505,921, Cl. 514-212.000.
Dumas, Ted A.; Vet, Maarten; and Buchmeyer, Sam K., to Rockwell International Corporation. Nuclear blast resistant parabolic antenna feed means. 4,506,265, Cl. 343-704.000.
Du Pont de Nemours, E. I., and Company: *See*—
Ben, Victor R., 4,506,070, Cl. 528-287.000.
Boswell, George A., Jr.; and Cocuzza, Anthony J., 4,505,905, Cl. 514-150.000.
Mirhej, Michael E., 4,505,867, Cl. 264-103.000.
Moore, Herbert; Santos, Stephen; and Wysong, Robert D., 4,505,888, Cl. 424-1.100.
Nelson, Thomas L., 4,505,013, Cl. 28-274.000.
Dupuy, James A., to Letourneau Company. Safety belt anchor. 4,505,011, Cl. 24-540.000.
Duwel, Edward C.; and Soderberg, John H., to Pitney Bowes Inc. Non-volatile memory serial number lock for electronic postage meter. 4,506,329, Cl. 364-464.000.
Dynamelt Limited: *See*—
Rogers, John, 4,505,669, Cl. 432-13.000.
Dynamit Nobel AG: *See*—
Fischer, Peter; Groh, Reiner; and Vahlensieck, Hans-Joachim, 4,506,087, Cl. 556-471.000.
E. R. Squibb & Sons, Inc.: *See*—
Jain, Nemichand B.; and Patel, Mahendra R., 4,505,890, Cl. 424-21.000.
Eastman Kodak Company: *See*—
Detwiler, Richard L.; Schlegel, Brooke P.; and Kissel, Thomas R., 4,505,801, Cl. 204-418.000.
Fearnside, William T., 4,506,300, Cl. 358-225.000.
Hartman, Susan E.; Allen, Michael E.; and Pascoe, William E., 4,506,094, Cl. 560-118.000.
Harvey, Donald M., 4,506,304, Cl. 360-14.300.
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,506,092, Cl. 560-103.000.
Toner, John L.; and Daniel, Daniel S., 4,505,800, Cl. 204-418.000.
Veillard, Dominique H., 4,506,306, Cl. 360-47.000.
Eaton Corporation: *See*—
Bopp, Warren G., 4,505,365, Cl. 192-3.290.
Savas, Charles R., 4,506,198, Cl. 318-301.000.
Eaton, Douglas W. Passive solar heated system. 4,505,262, Cl. 126-435.000.
Ebara, Katsuya: *See*—
Akamine, Kazuhiko; Ebara, Katsuya; Ito, Kazuyuki; and Mitani, Shinji, 4,505,824, Cl. 210-695.000.

Ebata, Y suhiko: *See*—
Yamane, Masataka; Kusashio, Akira; Kudaka, Satoru; Kobayashi, Tatuhiro; and Ebata, Yasuhiko, 4,505,129, Cl. 62-280.000.

Eberhardt, Werner: *See*—
Dierichs, Wolfgang; Eberhardt, Werner; and Wegner, Jurgen, 4,505,964, Cl. 428-85.000.

Eckenhoff, James B.: *See*—
Peery, John R.; and Eckenhoff, James B., 4,505,702, Cl. 604-209.000.

Edelmann, Ludwig: *See*—
Muller, Leo; Koder, Walter; Brandenstein, Manfred; Walter, Lothar; Edelmann, Ludwig; Bonengel, Roland; and Haas, Roland, 4,505,369, Cl. 192-98.000.

Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., to National Research Development Corporation. Methods of producing image information from objects. 4,506,222, Cl. 324-309.000.

Edelstein, William A.: *See*—
Bottomley, Paul A.; and Edelstein, William A., 4,506,223, Cl. 324-309.000.

Edgeworth, Thomas G.: *See*—
Huni, Jean-Paul R.; Hollingshead, Ethan A.; Edgeworth, Thomas G.; Sood, Raman R.; Dewing, Ernest W.; and Rogers, Charles J., 4,505,796, Cl. 204-243.00R.

Edgington, Gregory C.: *See*—
Circello, Joseph C.; Howell, Thomas H.; and Edgington, Gregory C., 4,506,340, Cl. 364-746.000.

Edmonds, Harold D.: *See*—
Cadwallader, Robert H.; Edmonds, Harold D.; and Kulkarni, Murlidhar V., 4,506,158, Cl. 250-338.000.

Eduard Kusters Maschinenfabrik: *See*—
Eichmanns, Herbert; Meyer, Wilhelm; and Kemper, Winfried, 4,505,713, Cl. 8-483.000.

Edwards, Robert S.: *See*—
Whiteman, James R.; Edwards, Robert S.; and Perciful, Jerry C., 4,505,832, Cl. 252-42.100.

Edwardson, Svante R., to AB Dentatus. Articulator for use in making dentures or parts thereof. 4,505,674, Cl. 433-59.000.

Edwin Cooper, Inc.: *See*—
Papay, Andrew G.; and O'Brien, Joseph P., 4,505,834, Cl. 252-51.50A.

Eertink, Bastiaan B. Method for cleaning waste water. 4,505,820, Cl. 210-604.000.

EFB Inc.: *See*—
Zahedi, Karim; Alexander, Jeffrey C.; and Zieve, Peter B., 4,505,723, Cl. 55-117.000.

Egli, Robert, to Sandoz Ltd. Azo compounds having a 5-substituted-4-chlorothiazolyl-2-diazo component radical. 4,505,857, Cl. 534-768.000.

Eheim, Franz, to Robert Bosch GmbH. Governor for fuel injection pump. 4,505,241, Cl. 123-373.000.

Ehrenfreund, Josef, to Ciba-Geigy Corporation. Pesticidal N-(4-alkenylthio)-phenyl-N'-benzoylureas. 4,505,931, Cl. 514-594.000.

Eichelberger, John L.: *See*—
Chen, Johnson C. H.; and Eichelberger, John L., 4,505,953, Cl. 427-212.000.

Eichmanns, Herbert; Meyer, Wilhelm; and Kemper, Winfried, to Eduard Kusters Maschinenfabrik. Method and apparatus for applying patterns to a planar structure from dye patches floated down ramp on film of carrier fluid. 4,505,713, Cl. 8-483.000.

Eida, Tsuyoshi: *See*—
Kanekiyo, Kazue; Kobayashi, Masatsune; Yokoyama, Yasumasa; Eida, Tsuyoshi; Komori, Tomoko; and Koike, Shoji, 4,505,749, Cl. 106-20.000.

Eidenschink, Rudolf: *See*—
Romer, Michael; Pohl, Ludwig; and Eidenschink, Rudolf, 4,505,837, Cl. 252-299.600.

Eimstad, Olav: *See*—
Brandsaeter, Helge; and Eimstad, Olav, 4,506,352, Cl. 367-21.000.

Einzinger, Richard, to Siemens Aktiengesellschaft. Substrate made of varistor material having a plurality of electronic components mounted thereon. 4,506,285, Cl. 357-80.000.

Ejiri, Yoshihiro: *See*—
Furusawa, Kahei; Nunokawa, Makoto; Ejiri, Yoshihiro; Yamamoto, Hitoshi; Yamazaki, Yoshihiko; and Tatekura, Koichi, 4,505,540, Cl. 350-96.200.

Ekono, Inc.: *See*—
Seppanen, Olli; Punttila, Antero; and Sulku, Jukka, 4,505,259, Cl. 126-429.000.

Elbe, Ronald E. Front sight for small arms. 4,505,047, Cl. 33-233.000.

Elder, James Donald: *See*—
Bergeron, Hervin J., Jr., 4,505,325, Cl. 165-45.000.

Electric Power Research Institute, Inc.: *See*—
Lin, Kou C., 4,506,248, Cl. 336-233.000.

Electrodyne Research Corporation: *See*—
Strohmeyer, Charles, Jr., 4,505,209, Cl. 110-245.000.

Electronics Corporation of Israel Ltd.: *See*—
Henquin, Teodor; and Zeev, Ya'acov B., 4,506,359, Cl. 370-81.000.

Eli Lilly and Company: *See*—
Hershberger, Charles L.; Radue, Anna K.; and Rosteck, Paul R., Jr., 4,506,013, Cl. 435-172.300.

El Kadiri Cherkaoui el Moursli, Fouzia: *See*—
Armand, Michel B.; and El Kadiri Cherkaoui el Moursli, Fouzia, 4,505,997, Cl. 429-192.000.

Elmis, Herbert, to ITT Industries, Inc. Integrated circuit for television receivers comprising a sonic separator with a clamping circuit. 4,506,297, Cl. 358-153.000.

Elms, Robert T., to North American Philips Lighting Corporation. Apparatus for operating HID lamp at high frequency with high power factor and for providing standby lighting. 4,506,195, Cl. 315-205.000.

El-On, Joseph; and Jacobs, Geoffrey P., to Orvet B.V. Compositions and methods for topical treatment of cutaneous leishmaniasis with paromomycin. 4,505,901, Cl. 514-38.000.

Elorac, Ltd.: *See*—
Bernstein, Joel E., 4,505,896, Cl. 424-164.000.

Elorza, Ramon H. Apparatus for piloting sailboards. 4,505,216, Cl. 114-39.000.

Elslager, Edward F.; and Werbel, Leslie M., to Warner-Lambert Company. N,N-diethyl-5-methyl-2H-1-benzothiopyrano-4,3,2-cd-indazole-2-ethanamine compositions and methods for their use. 4,505,925, Cl. 514-405.000.

Elvidge, John A.: *See*—
Marks, Robert E.; Burton, James S.; Elvidge, John A.; and Shah, Saresh, 4,505,898, Cl. 514-18.000.

EMCO Wheaton International Limited: *See*—
Young, Colin G., 4,505,249, Cl. 123-527.000.

Emhart Industries, Inc.: *See*—
Foster, Thomas V., 4,505,730, Cl. 65-162.000.
Morris, Nicholas G.; Kingsbury, Charles M.; and Beckwith, Bruce R., 4,505,731, Cl. 65-225.000.

Empire Abrasive Equipment Corporation: *See*—
Sheesley, Gary; and Grudzinski, Michael, 4,505,077, Cl. 51-415.000.

Endo, Keiji: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,506,107, Cl. 174-25.00C.

Endo, Yoichi; Nakanishi, Kazuo; Namura, Hideki; Doi, Terukazu; Kusumoto, Katsunori; Shimizu, Kazuyuki; Yoshimi, Kazuhiko; Nagai, Shigeru; and Sato, Shoichi, to Nippon Kokan Kabushiki Kaisha. Rigid marine sail. 4,505,217, Cl. 114-103.000.

Endoh, Kunihisa; and Hayakawa, Yasumitsu, to Toko, Inc. Hybrid circuit device. 4,506,238, Cl. 333-138.000.

Energy Equipment Company Ltd., The: *See*—
Caplin, Peter B., 4,505,230, Cl. 122-4.00D.

Engeler, William E.: *See*—
Mazin, Moshe; and Engeler, William E., 4,506,349, Cl. 365-189.000.

Engelhard Corporation: *See*—
Amundsen, Alan R.; and Stern, Eric W., 4,505,928, Cl. 514-492.000.
Dettling, Charles J.; and Terry, Peter L., 4,505,992, Cl. 429-36.000.

Engert, Reinhard: *See*—
Stockl, Klaus; and Engert, Reinhard, 4,505,514, Cl. 297-322.000.

Engineering Patents & Equipment Limited: *See*—
Martin, John S., 4,505,444, Cl. 244-122.0AE.

Englund, Arvid E., Jr., to General Electric Company. Bandwidth control circuit for a phase locked loop. 4,506,233, Cl. 331-17.000.

Enichimica Secondaria S.p.A.: *See*—
Invernizzi, Renzo; and Ligorati, Ferdinando, 4,506,027, Cl. 502-9.000.

Enlund, Birger S. I.: *See*—
Gadefelt, Bengt G.; and Enlund, Birger S. I., 4,505,348, Cl. 180-89.140.

Entrepose d'Equipements Mecaniques et Hydrauliques E.M.H.: *See*—
Andrier, Bernard, 4,505,620, Cl. 405-224.000.

Entrepose G.T.M. pour les Travaux Petroliers Maritimes et PM: *See*—
Andrier, Bernard, 4,505,620, Cl. 405-224.000.

Entwistle, Stanley D., to Northern Telecom Limited. Testing of wire prior to plating. 4,505,159, Cl. 73-847.000.

Enzyme Systems Products: *See*—
Rasnick, David W.; and Bissell, Eugene R., 4,505,852, Cl. 260-112.50R.

Epishin, Pavel P.: *See*—
Telis, Alexandr I.; Epishin, Pavel P.; Korzhov, Viktor I.; Makarov, Gennady A.; Kotlyarenko, Iosif Y.; and Grischenko, Nikolai V., 4,506,143, Cl. 219-497.000.

Ergenics, Inc.: *See*—
Golben, Peter M., 4,505,120, Cl. 62-48.000.

Erich Scholze GmbH & Co. KG: *See*—
Scholze, Gottfried; Scholze, Dietrich; and Maier, Johannes, 4,505,439, Cl. 242-68.400.

Erlam, David P., to Rittal-Werk Rudolf LOH GmbH & Co., KG. Card frames. 4,505,392, Cl. 211-26.000.

Ernst Leitz Wetzlar GmbH: *See*—
Reichel, Artur, 4,505,175, Cl. 83-703.000.

Erpicum, Emile; and Dehan, Louis, to Colgate-Palmolive Company. Disposable adult diaper. 4,505,706, Cl. 604-389.000.

Esch, John W.: *See*—
Bennett, Donald B.; and Esch, John W., 4,506,325, Cl. 364-200.000.

ESCO Corporation: *See*—
Schmidt, Paul W., 4,505,761, Cl. 148-9.00R.

Esmay, Edward N.: *See*—
Bridson, William D.; and Esmay, Edward N., 4,505,556, Cl. 350-532.000.

Esselte Pendaflex Corporation: *See*—
Solomon, Jack, 4,505,388, Cl. 206-425.000.

Esser, Karl; and Minuth, Walter, to Hoechst Aktiengesellschaft. Plasmid pAC 1, a process for obtaining it and its use. 4,506,014, Cl. 435-172.300.

Essig, Karl, to H. Stoll GmbH & Co. Flat knitting machine. 4,505,134, Cl. 66-60.00R.

Ethyl Corporation: *See*—
Mueller, Warren B.; and Jones, Jesse D., 4,506,049, Cl. 524-139.000.

Etschenberg, Eugen: *See*—
Biedermann, Jurgen; Etschenberg, Eugen; Friehe, Hugo; Scheef, Wolfgang; and Winkelmann, Johannes, 4,505,854, Cl. 260-112.50R.

Evani, Syamalarao: *See*—
Rose, Gene D.; Dennis, Kent S.; and Evani, Syamalarao, 4,505,827, Cl. 252-8.55R.

Evans, Darrell L., to Atlantic Pacific Marine Corporation. Method of supporting a shallow water drilling barge. 4,505,615, Cl. 405-196.000.

Evans, William P.; McCabe, Robert J.; and Naviasky, Eric H., to Westinghouse Electric Corp. Latching type comparator. 4,506,171, Cl. 307-362.000.

Everts, Robert G. Coupling for interconnecting two handle portions of a power driven implement. 4,505,040, Cl. 30-296.00R.

Ex-Cell-O Corporation: *See*—
Skrycki, Andrew R., 4,505,486, Cl. 277-235.00B.

Exxon Research & Engineering Co.: *See*—
Abele, Wolfgang P., 4,505,201, Cl. 102-324.000.
Wisotsky, Max J., 4,505,829, Cl. 252-32.70E.

Fabrique Nationale Herstal: *See*—
Vanhoutte, Jan E., 4,505,480, Cl. 273-73.00C.

Fairchild, Meredith H., to TP Industrial, Inc. Plastic bottle cleaner composition and method. 4,505,836, Cl. 252-174.140.

Fairey, Norman R.: *See*—
Childs, John B.; and Fairey, Norman R., 4,505,878, Cl. 419-67.000.

Falckenberg, Richard; Foell, Helmut; and Grabmaier, Josef, to Siemens Aktiengesellschaft. Device for asymmetrically coating a tape-shaped carrier body with silicon for further processing into solar cells. 4,505,221, Cl. 118-101.000.

Falkner, Raimund. Mechanism with continuous adjustment for the transmission of a rotary motion between two coaxial shafts. 4,505,163, Cl. 74-63.000.

Fallos, George: *See*—
Reinert, Warren; and Fallos, George, 4,505,470, Cl. 271-100.000.

Fanuc Ltd: *See*—
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,506,331, Cl. 364-474.000.

Fargo Mfg. Company, Inc.: *See*—
LaMontagne, Robert R., 4,505,503, Cl. 292-315.000.

Farkas, Eugene L. Hack saw attachment for sabre saw. 4,505,037, Cl. 30-122.000.

Farmweld, Inc.: *See*—
Hartke, Charles A.; and Brummer, Francis A., 4,505,227, Cl. 119-52.00R.

Fasolino, Gabriel V., to Hewitt, Delbert C. Surface cleaning device. 4,505,001, Cl. 15-250.00A.

Fazekas, George: *See*—
Vukanovic, Vladimir; Butler, Susannah M.; Fazekas, George; and Miller, John R., 4,505,947, Cl. 427-34.000.

Fearnside, William T., to Eastman Kodak Company. Film video player with zoom, scan, and automatic border control. 4,506,300, Cl. 358-225.000.

Fedde, Chris D.; and Carter, Dennis L., to Rockwell International Corporation. Radio reception path monitor for a diversity system. 4,506,385, Cl. 455-226.000.

Feeney, Francis T. Male sanitary device. 4,505,707, Cl. 604-393.000.

Felder, Louis: *See*—
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,505,794, Cl. 204-159.240.
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,506,083, Cl. 549-27.000.

Feldmann, Hugo: *See*—
Beerens, Hugo; Feldmann, Hugo; Gipperich, Theodor; Kirchhoff, Hans; Kusel, Siegfried; Schlanzke, Claus G.; and Nobis, Dieter, 4,505,374, Cl. 198-448.000.

Fennel, Robert B. Pilfer proofing system for electric utility meter box. 4,505,530, Cl. 339-38.000.

Fenyes, Joseph G.; and Pera, John D., to Buckman Laboratories, Inc. Method of preservation of aqueous systems by addition to said systems of quaternary ammonium salts of hexamethylenetetramine. 4,505,831, Cl. 252-34.000.

Fenyes, Joseph G.; and Pera, John D., to Buckman Laboratories, Inc. Polymeric quaternary ammonium compounds and their uses. 4,506,081, Cl. 548-523.000.

Ferguson, John H., Jr.: *See*—
Woodruff, Frank; Ferguson, John H., Jr.; and Hoffman, John R., 4,505,108, Cl. 60-327.000.

Ferrari, Gianpietro, to Honeywell Information Systems Italia. Step motor driving circuit. 4,506,207, Cl. 318-696.000.

Ferrini, Pier G.; Rosai, Alberto; and Haas, Georges, to Ciba-Geigy Corporation. Substituted anthranilamides and pharmaceutical preparations containing these compounds. 4,505,913, Cl. 514-183.000.

Fetzer, Fred: *See*—
Miller, Michael E.; and Fetzer, Fred, 4,505,593, Cl. 366-152.000.

Fetzer, Jurgen: *See*—
Braun, Karl; and Fetzer, Jurgen, 4,505,273, Cl. 128-335.000.

Fewin, Fred A., Jr.: *See*—
Warner, Lee A.; and Fewin, Fred A., Jr., 4,505,631, Cl. 414-359.000.

Fiarman, Sidney; Degen, Michael F.; and Peters, Henry F., to United States of America, Energy. Tamper-indicating seal. 4,505,218, Cl. 116-200.000.

Fiat Auto S.p.A.: *See*—
Burgio di Aragona, Antonio, 4,505,187, Cl. 92-31.000.

Fidler, John; and Green, John M., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Multi source cartridge for dispersing a riot control agent. 4,505,202, Cl. 102-357.000.

Field, Martin J.; Makusij, Andrew J.; and Rosin, Donald A., to General Motors Corporation. Fuel pressure regulator. 4,505,296, Cl. 137-510.000.

Fields, Ellis K., to Standard Oil Company (Indiana). 3-Sulfoxy-1,2-propylene glycols-1-esters of tricyclo $(4.2.2.0^{2,5})$ dec-9-ene-3,4,7,8-tetracarboxylic acid. 4,506,093, Cl. 560-117.000.

Fike Metal Products Corporation: *See*—
Hinrichs, James O., 4,505,180, Cl. 89-8.000.

Filipi, Charles J. Expandable anvil surgical stapler. 4,505,414, Cl. 227-19.000.

Filippini, Andrea; and Carobbi, Renato, to Sirac S.p.A. Stable boron resins of high selective absorbent power. 4,506,036, Cl. 521-53.000.

Finell, Lewis R.: *See*—
Fuller, Tom E.; and Finell, Lewis R., 4,505,787, Cl. 204-67.000.

Fink, Carl M.; and Holman, Edward C., to Nuclear & Environmental Protection, Inc. Portable maintenance exhaust hood. 4,505,190, Cl. 98-115.100.

Fink, Garold K.: *See*—
Yantsen, Ivan A.; Bekishev, Kenes K.; Savchak, Orest G.; Klok, Alexandr B.; Zhanabaev, Tolgat M.; Pakshtas, Mechislav-Valentinas K.; Glotov, Boris N.; Fink, Garold K.; Timkin, Alexei F.; Zorin, Nikolai I.; and Bobylev, Leonid M., 4,505,340, Cl. 173-134.000.

Finn, Arnold H., to Taco Products, Incorporated. Cylindrical wedge. 4,505,313, Cl. 145-29.00R.

Firestone Tire & Rubber Company, The: *See*—
Hergenrother, William L.; and Doshak, John M., 4,506,050, Cl. 524-143.000.

Fischer, Peter; Groh, Reiner; and Vahlensieck, Hans-Joachim, to Dynamit Nobel AG. Method for the continuous preparation of alkoxysilanes. 4,506,087, Cl. 556-471.000.

Fischer, Rolf: *See*—
Weitz, Hans-Martin; Fischer, Rolf; and Paust, Joachim, 4,506,096, Cl. 560-262.000.

Fissmann, Hans-Joachim: *See*—
Osswald, Manfred; Rau, Hanns; and Fissmann, Hans-Joachim, 4,505,052, Cl. 34-114.000.

Flakt AB: *See*—
Andersson, Karl-Hugo; Karlsson, Ingemar; and Quick, Rolf, 4,505,053, Cl. 34-155.000.

Flango, William E.: *See*—
Dell, William J.; Gonsalves, Alexander A.; and Flango, William E., 4,505,943, Cl. 426-565.000.

Flehmig, Bertram. Hepatitis-A viruses adapted to human fibroblast cells. 4,506,016, Cl. 435-237.000.

Fleigle, David H.; and Fleigle, Phyllis A. Knocked-down easily-assembled canning-lid-sterilizing rack. 4,505,393, Cl. 211-41.000.

Fleigle, Phyllis A.: *See*—
Fleigle, David H.; and Fleigle, Phyllis A., 4,505,393, Cl. 211-41.000.

Fleischman, Jonas. Arrangement for preventing operation of an electric switch. 4,506,120, Cl. 200-42.00R.

Flesher, Peter; and Allen, Adrian S., to Allied Colloids Limited. Inverse suspension polymerization process. 4,506,062, Cl. 526-211.000.

Fletcher, Ian J.: *See*—
Balli, Heinz; Gunzenhauser, Sigmund; Fletcher, Ian J.; and Bedekovic, Davor, 4,506,073, Cl. 546-64.000.

Flinn, Jack L., Jr. Novelty alarm clock. 4,505,597, Cl. 368-250.000.

Flint, John C. E.: *See*—
Booth, Stanley H.; and Flint, John C. E., 4,505,168, Cl. 74-687.000.

Floyd, William C.; and North, Bernard F., to Sun Chemical Corporation. Cyclic urea/glyoxal/polyol condensates and their use in treating textile fabrics and paper. 4,505,712, Cl. 8-186.000.

Flynn, Michael J., to Technicare Corporation. Hybrid collimator. 4,506,374, Cl. 378-2.000.

Focke & Co.: *See*—
Focke, Heinz; and Balmer, Oskar, 4,505,385, Cl. 206-260.000.

Focke, Heinz; and Balmer, Oskar, to Focke & Co. Pouch pack for tobacco as well as a process and apparatus for making this. 4,505,385, Cl. 206-260.000.

Foell, Helmut: *See*—
Falckenberg, Richard; Foell, Helmut; and Grabmaier, Josef, 4,505,221, Cl. 118-101.000.

Fohl, Artur, to REPA Feinstanzwerk GmbH. Drive device for moving the end fitting of a passive safety belt. 4,505,496, Cl. 280-804.000.

Foos, Douglas E.: *See*—
Perchak, William C.; and Foos, Douglas E., 4,505,404, Cl. 220-339.000.

Foote Mineral Company: *See*—
Glover, William D.; and Lalich, Michael J., 4,505,747, Cl. 75-251.000.

Ford Aerospace & Communications Corporation: *See*—
Chan, Fred N.; and Wuethrich, Ernest E., 4,506,312, Cl. 361-240.000.

Ford, Ernest C., Jr.: *See*—
Bristowe, William W.; and Ford, Ernest C., Jr., 4,506,055, Cl. 525-424.000.

Ford, James M., to Olin Corporation. Dynamic gas disengaging apparatus and method for gas separation from electrolyte fluid. 4,505,789, Cl. 204-128.000.

Ford Motor Company: *See*—
Stocker, Raymond, 4,505,045, Cl. 33-181.0AT.
Stockton, Thomas R., 4,505,350, Cl. 180-143.000.

Weber, Neill, 4,505,991, Cl. 429-11.000.
Foreman, Gordon T.: *See*—
Bergamo, Robert L.; Foreman, Gordon T.; Gallaro, Anthony V.; and Nagel, Judy A., 4,505,999, Cl. 430-24.000.
Formica Corporation: *See*—
Hosler, John F., 4,505,974, Cl. 428-329.000.
Forschungsgesellschaft Druckmaschinen e.V.: *See*—
Wiesner, Reiner, 4,505,154, Cl. 73-150.00R.
Fory, Werner; Martin, Henry; and Pissiotas, Georg, to Ciba-Geigy Corporation. Oxime derivatives for protecting plant crops. 4,505,742, Cl. 71-93.000.
Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., to Foss, Janet Mary Penrose. Portable, foldable and convertible luggage trolley. 4,505,495, Cl. 280-651.000.
Foss, Janet Mary Penrose: *See*—
Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., 4,505,495, Cl. 280-651.000.
Foss, John: *See*—
Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., 4,505,495, Cl. 280-651.000.
Foster, Thomas V., to Emhart Industries, Inc. Method of cooling a mould. 4,505,730, Cl. 65-162.000.
Fram, Jerry R. Transmission drive with cyclic speed variations and uses thereof in compaction systems using dual wire-mesh belts. 4,505,690, Cl. 474-69.000.
Framatome & Cie: *See*—
Petetrot, Jean-Francois; and Parent, Pierre, 4,505,873, Cl. 376-216.000.
Raczynski, Wladyslaw, 4,505,637, Cl. 415-112.000.
Francis Tool Company: *See*—
Johnson, Timothy L., 4,505,407, Cl. 222-181.000.
Frank W. Murphy Manufacturer, Inc.: *See*—
Murphy, Frank W., Jr.; Carlton, Lewis M.; O'Mary, Bob L.; and Cruse, Teddy H., 4,505,288, Cl. 137-59.000.
Frankenberg, Alfred A.; and Scott, Douglas R., to Robertshaw Controls Company. Exhaust system for an internal combustion engine, burn-off unit and methods therefor. 4,505,106, Cl. 60-286.000.
Franz, John E., to Monsanto Company. N-Phosphonomethylglycine derivatives and use as herbicides. 4,505,736, Cl. 71-76.000.
Fraunhofer-Gesellschaft: *See*—
Schmidt, Helmut; Kaiser, Alfred; and Scholze, Horst, 4,505,985, Cl. 428-447.000.
Freedenthal, Carol B.; Meyers, Marion D.; and Stoner, Graham A., to Kocide Chemical Corporation. Copper based algaecides and aquatic herbicides. 4,505,734, Cl. 71-67.000.
Freeman, Delbert. Anti-intrusion skylight blind. 4,505,069, Cl. 49-64.000.
French, Errol J. Adjustably vented umbrella. 4,505,285, Cl. 135-20.00R.
Fresard, Marcel, to Multiphonie S.A. Electroacoustic transducer. 4,506,117, Cl. 179-114.00R.
Freyssinet International (STUP): *See*—
Dinis, Antonio; de la Fuente, Carlos; and Mondorf, Paul, 4,505,081, Cl. 52-223.00L.
Friedman, Bernard L.. *See*—
Hoh, Thomas G.; Friedman, Bernard L.; Borchert, Wendall; and Nixon, Eugene H., Jr., 4,505,162, Cl. 74-41.000.
Friedman, David: *See*—
Mansell, Barry N.; and Friedman, David, 4,506,298, Cl. 358-160.000.
Friehe, Hugo: *See*—
Biedermann, Jurgen; Etschenberg, Eugen; Friehe, Hugo; Scheef, Wolfgang; and Winkelmann, Johannes, 4,505,854, Cl. 260-112.50R.
Friteco, Inc.: *See*—
Mariotti, Rene G., 4,505,193, Cl. 99-330.000.
Frohberger, Paul-Ernst: *See*—
Jager, Gerhard; Buchel, Karl H.; Kramer, Wolfgang; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,505,922, Cl. 514-383.000.
Froning, Edward C.; and Graham, Gregory S. Liquid transfer device. 4,505,709, Cl. 604-411.000.
Frund, Louis: *See*—
Christinat, Pierre L.; and Frund, Louis, 4,505,135, Cl. 66-157.000.
Frusta, Georges; and Prudhon, Francois, to Atochem. Device which can be used for the combustion of corrosive products and process using this device. 4,505,667, Cl. 431-182.000.
Fuchs, Daniel G.; and Rudd, Larry R., to Knapheide Mfg. Co., The. Latching device. 4,505,501, Cl. 292-62.000.
Fuji Photo Film Co., Ltd.: *See*—
Hara, Hiroshi; Tobioka, Takashi; Nishizawa, Tetuo; and Yoshino, Takeshi, 4,505,562, Cl. 354-203.000.
Kozai, Katsuya, 4,505,560, Cl. 354-86.000.
Nakajima, Junya; Itoh, Isamu; Yamamuro, Kiyohiko; and Ogawa, Eiiti, 4,506,007, Cl. 430-393.000.
Sakaguchi, Shinji; Okamura, Hisashi; and Nakamura, Shigeru, 4,506,001, Cl. 430-213.000.
Seto, Yoshihiro, 4,505,387, Cl. 206-414.000.
Sugimoto, Tadao; and Ikeda, Hideo, 4,506,008, Cl. 430-502.000.
Takaki, Hideki; Hayashi, Hiroshi; Ono, Shigetoshi; and Okamura, Hisashi, 4,506,002, Cl. 430-215.000.
Tamoto, Koji; Umehara, Akira; Nagano, Teruo; Iwasaki, Masayuki; and Aotani, Yoshimasa, 4,505,793, Cl. 204-159.160.
Umemoto, Chiyuki; and Takahashi, Kenji, 4,505,989, Cl. 428-691.000.
Fuji Photo Optical Co., Ltd.: *See*—
Asano, Seiji; Kagechika, Takashi; and Ishiguro, Minoru, 4,505,568, Cl. 354-458.000.
Fuji Xerox Co., Ltd.: *See*—
Kume, Hiroshi, 4,506,361, Cl. 370-85.000.
Kurata, Masami; Saitoh, Hiroyuki; and Matsuda, Masakane, 4,505,574, Cl. 355-14.00E.
Kurata, Masami, 4,506,302, Cl. 358-285.000.
Fujii, Norio: *See*—
Hada, Kazunari; Fujii, Norio; Kawahara, Atsushi; Azuma, Toru; and Hazama, Junji, 4,506,382, Cl. 382-27.000.
Fujikawa, Takao: *See*—
Fukutsuka, Toshiro; Moritoki, Masato; Fujikawa, Takao; and Gennai, Norio, 4,505,762, Cl. 148-11.50R.
Fujimaki, Hiroto: *See*—
Fukuda, Hiroyuki; Kaji, Hisatsugu; Fujimaki, Hiroto; Yamanobe, Yoichiro; Hiruta, Masaru; and Ohmi, Sigeru, 4,506,028, Cl. 502-101.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, 4,506,076, Cl. 548-119.000.
Fujitsu Fanuc Limited: *See*—
Katsube, Hideo; Gamo, Gotaro; Kinoshita, Mitsuo; and Nomura, Yoshiyuki, 4,506,129, Cl. 219-69.00W.
Fujitsu Limited: *See*—
Hasuo, Shinya, 4,506,172, Cl. 307-462.000.
Higuchi, Mitsuo, 4,506,164, Cl. 307-264.000.
Fujitsu Ten Limited: *See*—
Mizuno, Masataka; Ito, Tatsuo; Sugawara, Shuji; Moriyama, Masakazu; Muto, Masahito; and Nakane, Shuji, 4,506,266, Cl. 343-715.000.
Fukamachi, Masaaki; and Sueyoshi, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Speed meter system for vehicle. 4,506,216, Cl. 324-166.000.
Fukasawa, Takaaki: *See*—
Sujaku, Takamichi; Aoyama, Shuki; and Fukasawa, Takaaki, 4,506,128, Cl. 219-10.55F.
Fukazawa, Takeshi: *See*—
Yamaguchi, Shunzo; Fukazawa, Takeshi; and Atsumi, Morihiro, 4,505,107, Cl. 60-303.000.
Fukuda, Hiroyuki; Kaji, Hisatsugu; Fujimaki, Hiroto; Yamanobe, Yoichiro; Hiruta, Masaru; and Ohmi, Sigeru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for preparing a fuel cell electrode substrate comprising carbon fibers. 4,506,028, Cl. 502-101.000.
Fukuda, Misao: *See*—
Tomiyori, Takashi; Fukuda, Misao; Yamashita, Iwao; Simizu, Nobuo; and Kumano, Takeshi, 4,505,073, Cl. 51-165.00R.
Fukumoto, Hiroshi: *See*—
Shinozuka, Kiyoshi; Otu, Koichi; and Fukumoto, Hiroshi, 4,505,755, Cl. 106-308.00B.
Fukunaga, Mitsuo; and Nagao, Isao, to Murata Kikai Kabushiki Kaisha. Yarn cutting device in twister. 4,505,099, Cl. 57-86.000.
Fukutsuka, Toshiro; Moritoki, Masato; Fujikawa, Takao; and Gennai, Norio, to Kabushiki Kaisha Kobe Seiko Sho. Method of producing compound-type superconducting wires. 4,505,762, Cl. 148-11.50R.
Fuller, John M.: *See*—
Barr, John D.; and Fuller, John M., 4,505,342, Cl. 175-329.000.
Fuller, Tom E.; and Finell, Lewis R., to Super Fuel Systems Incorporated. Process for production of a carbide by-product with microwave energy and aluminum by electrolysis. 4,505,787, Cl. 204-67.000.
Fulton, Donald E.: *See*—
Comstock, Robert H.; Curtiss, William P.; and Fulton, Donald E., 4,506,321, Cl. 364-174.000.
Funabashi, Kiyomi; Kawamura, Fumio; Kikuchi, Makoto; and Yusa, Hideo, to Hitachi, Ltd. Process for solidifying radioactive waste pellets. 4,505,851, Cl. 252-628.000.
Funato, Hiroyoshi, to Ricoh Company, Ltd. Light scanning apparatus. 4,505,537, Cl. 350-3.710.
Funke, Manfred: *See*—
Scheurenberg, Helmut; and Funke, Manfred, 4,505,355, Cl. 180-308.000.
Furuichi, Katsushi, to Canon Kabushiki Kaisha. Variable magnification copying machine. 4,505,579, Cl. 355-55.000.
Furuichi, Shinji; Morita, Shigetoshi; Taka, Shunichi; and Suwabe, Hirohisa, to Hitachi Metals, Ltd. Magnetic head assembly. 4,506,308, Cl. 360-121.000.
Furukawa, Hisao; and Kato, Yasushi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. One component room temperature setting composition. 4,506,052, Cl. 524-357.000.
Furukawa, Masahiro: *See*—
Kusakabe, Hiroyoshi; Ishiko, Hideo; Okumura, Takeshi; Izumi, Masashi; and Furukawa, Masahiro, 4,505,123, Cl. 62-148.000.
Furukawa, Yoshimi: *See*—
Sano, Shoichi; and Furukawa, Yoshimi, 4,505,491, Cl. 280-91.000.
Furusawa, Kahei; Nunokawa, Makoto; Ejiri, Yoshihiro; Yamamoto, Hitoshi; Yamazaki, Yoshihiko; and Tatekura, Koichi, to Kokusai Denshin Denwa Kabushiki Kaisha. Spliced portion housing structure for optical fiber in optical submerged repeater. 4,505,540, Cl. 350-96.200.
Futami, Toru: *See*—
Kishi, Norimasa; Noso, Kazunori; and Futami, Toru, 4,506,377, Cl. 381-41.000.
Noso, Kazunori; Kishi, Norimasa; Futami, Toru; Nomura, Hiroyuki; and Shiraishi, Yasuhiro, 4,506,378, Cl. 381-43.000.
Future Tech, Inc.: *See*—
Bennett, James W.; Howe, Gary L.; Jaakola, Kenneth A.; and Koutavas, Samuel G., 4,506,138, Cl. 219-205.000.

Gabor, Martin P.: *See*—
Neuburger, Werner; and Gabor, Martin P., 4,505,061, Cl. 40-489.000.
Gabor, Thomas; Broberg, David E.; Diersen, Gunther H.; and Rowenhorst, Donley D., to Minnesota Mining and Manufacturing Company. Granular silicon carbide abrasive grain coated with refractory material, method of making the same and articles made therewith. 4,505,720, Cl. 51-295.000.
Gadefelt, Bengt G.; and Enlund, Birger S. I., to Saab-Scania Aktiebolag. Arrangement in a heavy motor vehicle to achieve relative rotation in a conduit connection. 4,505,348, Cl. 180-89.140.
Gaeng, Manfred: *See*—
Hackenberger, Alfred; Patsch, Manfred; and Gaeng, Manfred, 4,506,089, Cl. 560-020.000.
Gagliani, John; Sorathia, Usman A. K.; and Lee, Raymond, to I M L Corporation. Development of polyimide foams with blowing agents. 4,506,038, Cl. 521-103.000.
Gaines, Robert C.: *See*—
Harding, Margot J.; Gaines, Robert C.; and Gess, Jerome M., 4,505,775, Cl. 162-9.000.
Gajda, Jacek Z.: *See*—
Sendzimir, Tadeusz; and Gajda, Jacek Z., 4,505,438, Cl. 242-55.000.
Gajewski, Henry M.; and Measells, Paul, to Baxter Travenol Laboratories, Inc. Blood component storage container and method utilizing a polyvinyl chloride plastic formulation free or essentially free of leachable materials. 4,505,708, Cl. 604-408.000.
Galburt, Daniel, to Perkin-Elmer Corporation, The. Electro-magnetic apparatus. 4,506,204, Cl. 318-653.000.
Galburt, Daniel: *See*—
Trost, David; and Galburt, Daniel, 4,506,205, Cl. 318-653.000.
Gale, Robert M.; and Urquhart, John, to ALZA Corporation. Fluid receiving receptacle housing biocide dispensing device. 4,505,703, Cl. 604-317.000.
Gallaro, Anthony V.: *See*—
Bergamo, Robert L.; Foreman, Gordon T.; Gallaro, Anthony V.; and Nagel, Judy A., 4,505,999, Cl. 430-24.000.
Gamble, Christopher L. Skier's accessory tool. 4,504,993, Cl. 7-165.000.
Gamo, Gotaro: *See*—
Katsube, Hideo; Gamo, Gotaro; Kinoshita, Mitsuo; and Nomura, Yoshiyuki, 4,506,129, Cl. 219-69.00W.
Ganoung, David P. Apparatus using a continuously variable transmission to improve fuel economy. 4,505,169, Cl. 74-858.000.
Garg, Shyam G.: *See*—
Bohr, Mark T.; Yu, Ken K.; Yau, Leo D.; and Garg, Shyam G., 4,505,026, Cl. 29-577.00C.
Garrett Corporation, The: *See*—
Ness, Ronald J., 4,505,105, Cl. 60-200.100.
Gaylord, Norman G., to Gaylord Research Institute Inc. Maleic anhydride-modified polymers and process for preparation thereof. 4,506,056, Cl. 524-445.000.
Gaylord Research Institute Inc.: *See*—
Gaylord, Norman G., 4,506,056, Cl. 524-445.000.
GCA Corporation: *See*—
Lis, Steven A., 4,506,005, Cl. 430-317.000.
Gearhart Industries, Inc.: *See*—
Mougne, Marcel L., 4,506,156, Cl. 250-266.000.
Gebhardt, Ulrich: *See*—
Mund, Konrad; Luft, Gunter; and Gebhardt, Ulrich, 4,505,784, Cl. 204-1.00T.
Gebhardt, Uwe: *See*—
Herrmann, Wolfgang; and Gebhardt, Uwe, 4,506,071, Cl. 544-49.000.
Gee, Mark G.: *See*—
Almond, Eric A.; and Gee, Mark G., 4,505,721, Cl. 51-309.000.
Geerdes, Dirk J. F.; and Zabel, Klaus H., to Akzo N.V. Process for coating wood or wood fibres-containing substrates, and an oxidatively drying coating composition to be used therewith. 4,505,986, Cl. 428-481.000.
Gehrig, Manfred; Barthels, Manfred; and Wienges, Hans, to Hag GF Aktiengesellschaft. Regeneration of caffeine-loaded activated carbon with hot water. 4,506,072, Cl. 544-274.000.
Geist, Michael, to BASF Farben & Fasern AG. Heat-hardenable binder mixture. 4,505,981, Cl. 428-418.000.
Gen, Tamar G.; and Cydzik, Edward A., to Raychem Corporation. Soldering methods and devices. 4,505,421, Cl. 228-224.000.
General Dynamics Corporation: *See*—
Bradfield, Ganey W.; and Cragin, Glynn P., Jr., 4,505,443, Cl. 244-12.500.
General Electric Company: *See*—
Albers, Francis G.; and Neves, Fernando B., 4,505,558, Cl. 354-4.000.
Ashby, Bruce A.; and Lucas, Gary M., 4,506,058, Cl. 524-730.000.
Baliga, Bantval J., 4,506,282, Cl. 357-43.000.
Bottomley, Paul A.; and Edelstein, William A., 4,506,223, Cl. 324-309.000.
Burzminski, Michael J., 4,506,067, Cl. 528-196.000.
Englund, Arvid E., Jr., 4,506,233, Cl. 331-17.000.
Houston, John M., 4,506,369, Cl. 372-72.000.
Jones, Donald W.; and Miller, Timothy J. E., 4,506,181, Cl. 310-156.000.
Mark, Victor, 4,506,046, Cl. 524-83.000.
Mark, Victor, 4,506,064, Cl. 528-176.000.
Mazin, Moshe; and Engeler, William E., 4,506,349, Cl. 365-189.000.
Miller, Kenneth F.; and Belfoure, Edward L., 4,506,065, Cl. 528-194.000.
Owyang, King; and Stein, Leonard, deceased, 4,505,029, Cl. 29-589.000.
Salmon, Stuart C.; and Zeltner, Larry D., 4,505,075, Cl. 51-165.750.
Tam, Kwok C., 4,506,327, Cl. 364-414.000.
Vermilyea, Mark E., 4,506,247, Cl. 335-216.000.
General Electric Company p.l.c., The: *See*—
Rigden, Sydney A. R.; and Sweet, Ian J. H., 4,506,194, Cl. 315-200.00R.
General Foods Corporation: *See*—
Dell, William J.; Gonsalves, Alexander A.; and Flango, William E., 4,505,943, Cl. 426-565.000.
Jones, Gary V.; Meinhold, James F.; and Musto, Joseph A., 4,505,940, Cl. 426-424.000.
General Motors Corporation: *See*—
Field, Martin J.; Makusij, Andrew J.; and Rosin, Donald A., 4,505,296, Cl. 137-510.000.
General Signal Corporation: *See*—
Baxter, Ronald D., 4,505,799, Cl. 204-416.000.
Hitt, James J., 4,506,174, Cl. 307-490.000.
Mande; Irving; Right, Robert W.; and Killian, George W., 4,506,253, Cl. 340-506.000.
Right, Robert W.; and Mande, Irving, 4,506,254, Cl. 340-510.000.
Genest, Leonard J. Security dialing system for long distance telephone systems. 4,506,116, Cl. 179-90.0BD.
Gennai, Norio: *See*—
Fukutsuka, Toshiro; Moritoki, Masato; Fujikawa, Takao; and Gennai, Norio, 4,505,762, Cl. 148-11.50R.
Genuit, Luther L.; and Nowell, John R., to Honeywell Information Systems Inc. Annunciator control circuit. 4,506,256, Cl. 340-518.000.
Geophysical Company of Norway A/S: *See*—
Brandsaeter, Helge; and Eimstad, Olav, 4,506,352, Cl. 367-21.000.
Geophysical Survey Systems, Inc.: *See*—
Harmuth, Henning F., 4,506,267, Cl. 343-744.000.
George, Benjamin T.: *See*—
Pusic, Vladi; George, Benjamin T.; Smith, Monte E.; and Johnson, Craig B., 4,506,323, Cl. 364-200.000.
George, David W., to Wean United, Inc. Arrangement, apparatus, and method to form laminates, and the like such as copper clad. 4,505,771, Cl. 156-285.000.
George Fischer Ltd.: *See*—
Tanner, Hans, 4,505,316, Cl. 164-37.000.
Geosource Inc.: *See*—
Day, Roger W.; and Grichar, Charles N., 4,505,591, Cl. 366-134.000.
Gerhard, Helmut, to Westerwalder Eisenwerk Gerhard GmbH. Freight container and corner fitting therefor. 4,505,402, Cl. 220-1.500.
Gertsch, Ulrich, to TMC Corporation. Release type ski binding. 4,505,494, Cl. 280-618.000.
Gess, Jerome M.: *See*—
Harding, Margot J.; Gaines, Robert C.; and Gess, Jerome M., 4,505,775, Cl. 162-9.000.
Getto, Leslie: *See*—
Matzkin, Harry; and Getto, Leslie, 4,505,504, Cl. 292-337.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Hauschopp, Alois, 4,505,518, Cl. 299-34.000.
Temme, Helmut, 4,505,379, Cl. 198-731.000.
Giani, Enrico: *See*—
Ramachandran, Kovilvila; and Giani, Enrico, 4,505,798, Cl. 204-298.000.
Giles, C. Lee: *See*—
Blodgett, Jerry A.; Szu, Harold H.; Giles, C. Lee; and Athale, Ravindra, 4,505,544, Cl. 350-162.130.
Giller, Henricus F. J. I.; van Hees, Antonius J. M.; and Roelevink, Bauke J., to U.S. Philips Corporation. Electric reflector lamp. 4,506,185, Cl. 313-113.000.
Gillespie, John L. Apparatus for hydraulic tree injection. 4,505,067, Cl. 47-57.500.
Gilmore-Kramer, Inc.: *See*—
Bent, Kenneth R., Jr., 4,505,483, Cl. 277-34.000.
Gimar S.A.: *See*—
Mareau, Dominique, 4,505,382, Cl. 198-819.000.
Ginsburgh, Irwin: *See*—
Walker, Donald C.; and Ginsburgh, Irwin, 4,505,308, Cl. 141-59.000.
Gipperich, Theodor: *See*—
Beerens, Hugo; Feldmann, Hugo; Gipperich, Theodor; Kirchhoff, Hans; Kusel, Siegfried; Schlanzke, Claus G.; and Nobis, Dieter, 4,505,374, Cl. 198-448.000.
Gist-Brocades N.V.: *See*—
Apontoweil, Peter; and Krasselt, Manfred M., 4,505,892, Cl. 424-89.000.
GKN Technology Limited: *See*—
Le Gallais, Raymond, 4,505,460, Cl. 267-54.00R.
Glasstech, Inc.: *See*—
McMaster, Harold A., 4,505,671, Cl. 432-144.000.
Glaverbel: *See*—
Cozac, Daniel; and Rogghe, Hugo, 4,505,781, Cl. 156-640.000.
Smets, Jacques; and Laurent, Michel, 4,506,125, Cl. 219-10.530.
Smets, Jacques; and Laurent, Michel, 4,506,126, Cl. 219-10.530.
Tousaint, Francois; and Hoyois, Jean-Claude, 4,505,538, Cl. 350-357.000.
Globin, Nikolai K.: *See*—
Makarov, Viktor M.; Paton, Boris E.; Globin, Nikolai K.; Usenko, Viktor G.; Khisnatulin, Enver R.; Ziselman, Boris G.; Serov, Petr G.; Shel, Marat M.; and Rozenberg, Ovshiya O., 4,505,417, Cl. 228-17.700.

Glotov, Boris N.: *See*—
Yantsen, Ivan A.; Bekishev, Kenes K.; Savchak, Orest G.; Klok, Alexandr B.; Zhanabaev, Tolgat M.; Pakshtas, Mechislav-Valentinas K.; Glotov, Boris N.; Fink, Garold K.; Timkin, Alexei F.; Zorin, Nikolai I.; and Bobylev, Leonid M., 4,505,340, Cl. 173-134.000.
Glover, William D.; and Lalich, Michael J., to Foote Mineral Company. Stabilizing inoculent for gray iron. 4,505,747, Cl. 75-251.000.
Goeke, Eberhard; and Ludolph, Jurgen, to Krupp Koppers GmbH. Process for cleaning and cooling partial oxidation gases containing dust-like pollutants. 4,505,719, Cl. 48-202.000.
Golben, Peter M., to Ergenics, Inc. Hydrogen compressor. 4,505,120, Cl. 62-48.000.
Goldfarb, Rebecca D.: *See*—
Nix, Paul T.; Goldfarb, Rebecca D.; Stong, Linda J.; Sulick, Lorraine E.; Trivedi, Ramesh C.; and Morgenstern, Stanley W., 4,505,756, Cl. 127-29.000.
Goldman, Ilan. Protective filling, particularly for safe walls. 4,505,208, Cl. 109-85.000.
Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, to Ortho Pharmaceutical Corporation. Enzyme-resistant immunomodulatory peptides. 4,505,853, Cl. 260-112.50R.
Golias, Tipton L., to Helena Laboratories, Inc. Microscope slide. 4,505,557, Cl. 350-536.000.
Golovkina, Svetlana I.: *See*—
Lykov, Mikhail V.; Lembrikov, Vladimir M.; Golovkina, Svetlana I.; Malakhova, Nadezhda N.; Sterlin, Vladimir N.; Kochetkov, Viktor N.; and Markovin, Gennady M., 4,505,733, Cl. 71-34.000.
Gonsalves, Alexander A.: *See*—
Dell, William J.; Gonsalves, Alexander A.; and Flango, William E., 4,505,943, Cl. 426-565.000.
Gonser, Donald I., to Dentsply Research & Development Corp. Endodontic unit. 4,505,676, Cl. 433-119.000.
Gonzalez, Brian L. Portable antenna with wedge-shaped reflective panels. 4,506,271, Cl. 343-915.000.
Gonzalez-Sanabria, Olga D.: *See*—
Hsu, Li-Chen; Philipp, Warren H.; Sheibley, Dean W.; and Gonzalez-Sanabria, Olga D., 4,505,998, Cl. 429-206.000.
Goodman, Jack E., to Chevron Research Company. Optical fiber coating apparatus. 4,505,223, Cl. 118-401.000.
Goodman, Nelson; and Cunningham, Brian C., to Stauffer Chemical Company. Method for testing microbial degradation of cellulose. 4,506,010, Cl. 435-32.000.
Goodyear Tire & Rubber Company, The: *See*—
Henderson, James N.; Donbar, Ken W.; Barbour, John J.; and Bell, Anthony J., 4,506,031, Cl. 502-162.000.
Stelzer, Gary J.; and Harmon, Calvin, III, 4,505,984, Cl. 428-424.700.
Goodyer, Anthony W. Toilet installation. 4,504,983, Cl. 4-321.000.
Gordon, Alan M.: *See*—
Bennett, Joseph M.; Gordon, Alan M.; Silverio, Vincent J.; and Zydney, Herbert M., 4,506,346, Cl. 364-900.000.
Goth, James: *See*—
Goth, John; and Goth, James, 4,505,459, Cl. 267-46.000.
Goth, John; and Goth, James. Leaf spring assembly for a vehicle. 4,505,459, Cl. 267-46.000.
Goto, Hirokazu: *See*—
Sawada, Takeshi; Yoneda, Kou; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, 4,506,220, Cl. 324-252.000.
Gottzein, Eveline; Keeve, Rolf; and Surauer, Michael, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Method and circuit arrangement for optimally controlling an air gap between an electromagnetically levitated vehicle and a rail. 4,505,206, Cl. 104-284.000.
Goucher, Kathleen S.: *See*—
Goucher, Ralph F.; and Goucher, Kathleen S., 4,505,364, Cl. 192-0.02R.
Goucher, Ralph F.; and Goucher, Kathleen S. Push-button clutch control system. 4,505,364, Cl. 192-0.02R.
Goudy, Richard A. Wheel with tire bead locking ring. 4,505,314, Cl. 152-398.000.
Gould Inc.: *See*—
Kryskow, J. Michael, Jr.; and Tanzman, Allan, 4,506,360, Cl. 370-85.000.
Morley, Richard E., 4,506,362, Cl. 371-13.000.
Gowan, John W., Jr., to Westvaco Corporation. Process for foam lowering and improvement of alum sensitivity of dispersed size. 4,505,754, Cl. 106-238.000.
Grabmaier, Josef: *See*—
Falckenberg, Richard; Foell, Helmut; and Grabmaier, Josef, 4,505,221, Cl. 118-101.000.
Graco Inc.: *See*—
Kelly, Lawrence S.; Schaffran, Dean L.; and Nii, Donald S., 4,505,405, Cl. 222-135.000.
Graeml, Edith, administrator: *See*—
Groess, Helmut; and Graeml, Horst, deceased, 4,505,639, Cl. 416-97.00R.
Graeml, Horst, deceased: *See*—
Groess, Helmut; and Graeml, Horst, deceased, 4,505,639, Cl. 416-97.00R.
Graf, Kunibert: *See*—
Pfalzgraf, Manfred; and Graf, Kunibert, 4,505,357, Cl. 180-335.000.
Graham, Gregory S.: *See*—
Froning, Edward C.; and Graham, Gregory S., 4,505,709, Cl. 604-411.000.
Gram, Klaus, to Brodrene Gram A/S. Method of freezing articles in containers and apparatus for carrying out the method. 4,505,121, Cl. 62-60.000.
Graves, Jan D., to Norwalk Wastewater Equipment Company. Wastewater treatment plant. 4,505,813, Cl. 210-86.000.
Gray, Keith I.; and Meier, Henry G., to Brown Boveri Electric Inc. High voltage corona shield. 4,506,110, Cl. 174-144.000.
Green, Donald R., Jr.; and Stevens, Charles O., II, to AT&T Bell Laboratories. Single adjustment phase resolver with constant amplitude output. 4,506,231, Cl. 330-129.000.
Green, Frederick A.: *See*—
Seedhouse, Frederick A.; and Green, Frederick A., 4,505,581, Cl. 355-58.000.
Green, John M.: *See*—
Fidler, John; and Green, John M., 4,505,202, Cl. 102-357.000.
Greene, Bettye W.; and Chen, Sun-Lin, to Dow Chemical Company, The. Stable latexes containing phosphorus surface groups. 4,506,057, Cl. 524-461.000.
Greene, Edward E., to United States of America, Air Force. Laminated thermoplastic radome. 4,506,269, Cl. 343-872.000.
Greenhouse, Robert: *See*—
Muchowski, Joseph M.; and Greenhouse, Robert, 4,505,927, Cl. 514-413.000.
Gregory, Paul E., Jr.; and White, Roger N. Disposable surgical gown sleeve. 4,504,978, Cl. 2-59.000.
Gregory, Paul E., Jr.: *See*—
King, Mary K.; White, Roger N.; and Gregory, Paul E., Jr., 4,504,977, Cl. 2-51.000.
Grehl, William H., to O. F. Mossberg & Sons, Inc. Gas actuated operating mechanism for autoloading firearm. 4,505,183, Cl. 89-191.010.
Gretag Aktiengesellschaft: *See*—
Ott, Hans; Boegli, Rolf; Birch, Ulrich; Kipphan, Helmut; and Loffler, Gerhard, 4,505,589, Cl. 356-402.000.
Gretz, Ronald D.: *See*—
Thomas, John E.; Gretz, Ronald D.; and Tippins, George W., 4,505,141, Cl. 72-38.000.
Grichar, Charles N.: *See*—
Day, Roger W.; and Grichar, Charles N., 4,505,591, Cl. 366-134.000.
Griffiths, Anthony J.; and Allen, David W., to Vickers Australia Limited. Mineral processing apparatus. 4,505,811, Cl. 209-17.000.
Grimm, Wolfgang: *See*—
Schurle, Hermann; Grimm, Wolfgang; and Bammert, Hubert, 4,505,683, Cl. 434-365.000.
Grischenko, Nikolai V.: *See*—
Telis, Alexandr I.; Epishin, Pavel P.; Korzhov, Viktor I.; Makarov, Gennady A.; Kotlyarenko, Iosif Y.; and Grischenko, Nikolai V., 4,506,143, Cl. 219-497.000.
Groeneweg, Abraham: *See*—
Beckman, Leo H.; and Groeneweg, Abraham, 4,505,561, Cl. 354-123.000.
Groess, Helmut; and Graeml, Horst, deceased (by Graeml, Edith, administrator), to MTU Motoren-Und Turbinen-Union Muenchen GmbH. Axial-flow turbine blade, especially axial-flow turbine rotor blade for gas turbine engines. 4,505,639, Cl. 416-97.00R.
Groh, Reiner: *See*—
Fischer, Peter; Groh, Reiner; and Vahlensieck, Hans-Joachim, 4,506,087, Cl. 556-471.000.
Groman, James W.: *See*—
Leech, Charles A., III; Rancudo, Thomas J., Jr.; and Groman, James W., 4,505,297, Cl. 137-561.00A.
Gross, Jerome: *See*—
Bruns, Romaine R.; and Gross, Jerome, 4,505,855, Cl. 260-123.700.
Grouse, Alan F.: *See*—
Brown, Fred A.; and Grouse, Alan F., 4,506,218, Cl. 324-158.0MG.
Grudzinski, Michael: *See*—
Sheesley, Gary; and Grudzinski, Michael, 4,505,077, Cl. 51-415.000.
Gruen, Alfred J., to Interlake, Inc. Wire loop stitching machine head. 4,505,415, Cl. 227-88.000.
Grumman Aerospace Corporation: *See*—
Kirsch, Jerome; Kopsco, M. Alan; Markow, Edward; and Sturm, Michael, 4,505,441, Cl. 244-3.150.
Kirsch, Jerome; Kopsco, M. Alan; Markow, Edward; and Sturm, Michael, 4,505,442, Cl. 244-3.150.
Grumman Allied Industries, Inc.: *See*—
Alloca, Robert E.; and Mazon, Meyer I., 4,505,647, Cl. 417-252.000.
Grys, Rodger J.: *See*—
Millis, Donald E.; and Grys, Rodger J., 4,505,643, Cl. 417-12.000.
Grzelka, Andrew; Hodges, David R.; and Ruckdeschel, Lawrence M., to Litton Systems, Inc. Self-locking chock system for a jack-up rig unit. 4,505,616, Cl. 405-198.000.
Gsell, Laurenz, to Ciba-Geigy Corporation. Halovinyl-3,3-dimethylcyclopropanecarboxylic acid pyronyl esters useful for the protection of cultivated plants against the harmful effects of herbicides. 4,505,738, Cl. 71-88.000.
GTE Automatic Electric Inc.: *See*—
Reimer, William A., 4,505,394, Cl. 211-41.000.
Reimer, William A., 4,505,527, Cl. 339-17.0LM.
Reimer, William A., 4,505,528, Cl. 339-17.0LM.
GTE Communications Products Corporation: *See*—
Schmitt, Paul M., 4,506,115, Cl. 179-84.00C.
GTE Laboratories Incorporated: *See*—
Koenigsberg, William D.; and Wagenknecht, Arthur J., 4,506,192, Cl. 315-71.000.

GTE Products Corporation: *See*—
Hope, Lawrence L.; and Plumb, John L., 4,506,193, Cl. 315-169.300.
Kuo, Samuel C., 4,506,268, Cl. 343-792.500.
Thiry, William; Westlund, Arnold E., Jr.; and Puckett, Clarence D., 4,506,316, Cl. 362-309.000.

Guigonis, Jacques, to Societe Europeenne des Produits Refractaires. Mouldable refractory composition based on partially stabilized zirconia and on an aluminous hydraulic binder, its preparation and mouldings manufactured from this composition. 4,506,023, Cl. 501-104.000.

Gulati, Surender K.; and Schneider, Clayton E., Jr., to AT&T Bell Laboratories. Noise rejection Set-Reset Flip-Flop circuitry. 4,506,165, Cl. 307-272.00A.

Gulf & Western Manufacturing Company: *See*—
Charboneau, Ben J.; and Zerod, Richard D., 4,506,258, Cl. 340-618.000.

Gunzenhauser, Sigmund: *See*—
Balli, Heinz; Gunzenhauser, Sigmund; Fletcher, Ian J.; and Bedekovic, Davor, 4,506,073, Cl. 546-64.000.

Gupta, Bal K., to NCR Canada Ltd. - NCR Canada LTEE. Illumination system. 4,506,152, Cl. 250-216.000.

Gustavsson, Jack G., to Aktiebolaget S K F. Slalom ski binding. 4,505,493, Cl. 280-617.000.

Gut, Jiri; and van Oosten, Adriaan M., to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek. Insecticide composition, its preparation and its use. 4,505,934, Cl. 514-762.000.

Gutentag, Herbert N. Endodontic sealing apparatus and method. 4,505,679, Cl. 433-224.000.

Guttinger, Heinz: *See*—
Muggli, Jurg; and Guttinger, Heinz, 4,506,161, Cl. 250-574.000.

Guy, Robert K.: *See*—
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H.K. Porter, Inc.: *See*—
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H. Stoll GmbH & Co.: *See*—
Essig, Karl, 4,505,134, Cl. 66-60.00R.

H. Wohlenberg KG GmbH & Co.: *See*—
Hartlage, Jurgen, 4,505,173, Cl. 83-112.000.

Haar, Lucas H., to ITT Industries, Inc. Power booster. 4,505,114, Cl. 60-554.000.

Haas, Georges: *See*—
Ferrini, Pier G.; Rossi, Alberto; and Haas, Georges, 4,505,913, Cl. 514-183.000.

Haas, Roland: *See*—
Muller, Leo; Koder, Walter; Brandenstein, Manfred; Walter, Lothar; Edelmann, Ludwig; Bonengel, Roland; and Haas, Roland, 4,505,369, Cl. 192-98.000.

Hackenberger, Alfred; Patsch, Manfred; and Gaeng, Manfred, to BASF Aktiengesellschaft. Preparation of methyl m-nitrobenzoate. 4,506,089, Cl. 560-020.000.

Hada, Kazunari; Fujii, Norio; Kawahara, Atsushi; Azuma, Toru; and Hazama, Junji, to Nippon Kogaku K.K. Apparatus for detecting two-dimensional pattern and method for transforming the pattern into binary image. 4,506,382, Cl. 382-27.000.

Hada, Toshikatsu; and Isoya, Yukinori, to Aisan Kogyo Kabushiki Kaisha. Variable venturi carburetor. 4,505,250, Cl. 123-540.000.

Haddox, Mark L., to Jodon Engineering Associates, Inc. Method and apparatus for measuring engine compression ratio. 4,505,152, Cl. 73-117.200.

Haerdl, Stefan: *See*—
Hanle, Edgar; Wunderlich, Joachim; Zwickl, Johann; and Haerdl, Stefan, 4,505,511, Cl. 296-93.000.

Hafner, V. Walter: *See*—
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Hag GF Aktiengesellschaft: *See*—
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Hahn, Michael: *See*—
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Hajek, Manfred: *See*—
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Hakko Co., Ltd.: *See*—
Koga, Motoyuki, 4,505,613, Cl. 405-154.000.

Haldric, Bernard, to NACAM. Lightened yoke for a universal joint. 4,505,608, Cl. 403-13.000.

Hales, Gary W.: *See*—
DiBiano, Robert J.; Autenrieth, Kim A.; and Hales, Gary W., 4,505,668, Cl. 431-202.000.

Halkey-Roberts Corp.: *See*—
Lardner, George S.; and TenBarge, John S., 4,505,312, Cl. 141-326.000.

Halliburton Company: *See*—
Skinner, Neal G., 4,505,993, Cl. 429-100.000.

Hamada, Hiroshi; Take, Hiroshi; Yano, Kozo; and Inami, Yasuhiko, to Sharp Kabushiki Kaisha. Method for manufacturing an electrochromic display device. 4,505,021, Cl. 29-570.000.

Hamada, Takao; Tsuchiya, Nobuo; Ito, Yo; Inatani, Toshihiro; Takada, Yoshiyasu; Sumito, Mitsuo; Koitabashi, Toshimitsu; and Katayama, Hideshi, to Kawasaki Steel Corporation. Methods of producing and using amorphous mother alloy. 4,505,745, Cl. 75-129.000.

Hamel, Gerald, to Industries P. H. L., Inc. Bandmill mechanism. 4,505,176, Cl. 83-808.000.

Hammerschmidt, Winrich B.: *See*—
Seidel, Hartmut; and Hammerschmidt, Winrich B., 4,505,660, Cl. 425-129.00S.

Hanafusa, Saburo: *See*—
Yamada, Shinji; and Hanafusa, Saburo, 4,505,987, Cl. 428-553.000.

Hanle, Edgar; Wunderlich, Joachim; Zwickl, Johann; and Haerdl, Stefan, to Audi NSU Auto Union AG. Gasket for window pane. 4,505,511, Cl. 296-93.000.

Hannah, John, to Merck & Co., Inc. 6-N-Heterocyclyl penicillins. 4,505,915, Cl. 514-193.000.

Hannan, William J., to Itek Corporation. Optical data recorder system. 4,506,303, Cl. 358-302.000.

Hannen, Ulrich: *See*—
Weydt, Willy V. D.; Hannen, Ulrich; and Paetzel, Herbert, 4,505,188, Cl. 92-94.000.

Hannett, William J.; and Wilson, David S., to Carrier Corporation. Duplex compressor oil sump. 4,505,650, Cl. 417-426.000.

Hansen, Frede O. Wood joint cutter and method therefor. 4,505,086, Cl. 52-593.000.

Hansen, Per K., to Position Orientation Systems, Ltd. Ultrasonic position detecting system. 4,506,354, Cl. 367-101.000.

Hansz, Bernard: *See*—
Dubust, Jean-Claude; Boncoeur, Marcel; and Hansz, Bernard, 4,505,945, Cl. 427-8.000.

Hanyu, Yoshiaki: *See*—
Tochigi, Kenji; Hanyu, Yoshiaki; and Hiratsuka, Yutaka, 4,505,586, Cl. 356-301.000.

Hara, Elmer H.: *See*—
MacDonald, R. Ian; Hara, Elmer H.; and Hum, Robert H., 4,506,151, Cl. 250-213.00A.

Hara, Hiroshi; Tobioka, Takashi; Nishizawa, Tetuo; and Yoshino, Takeshi, to Fuji Photo Film Co., Ltd. Film supporting apparatus for cameras. 4,505,562, Cl. 354-203.000.

Harada, Naoki: *See*—
Omura, Takashi; Takahashi, Mikoto; Harada, Naoki; and Takeshita, Akira, 4,505,714, Cl. 8-549.000.

Harada, Tsuneo; Takemoto, Hisao; and Igarashi, Tatsuo, to Toyo Soda Manufacturing Co., Ltd. Process for preparation of aspartylphenylalanine alkyl esters. 4,506,011, Cl. 435-70.000.

Harding, Margot J.; Gaines, Robert C.; and Gese, Jerome M., to Weyerhaeuser Company. Method for preparation of cationic cellulose. 4,505,775, Cl. 162-9.000.

Harmon, Calvin, III: *See*—
Stelzer, Gary J.; and Harmon, Calvin, III, 4,505,984, Cl. 428-424.700.

Harmuth, Henning F., to Geophysical Survey Systems, Inc., a part interest. Frequency independent shielded loop antenna. 4,506,267, Cl. 343-744.000.

Harpell, Gary A.: *See*—
Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gordhanbhai N.; Poncha, Rustom P.; Skovrinski, Adam L.; and Lesco, James M., 4,505,786, Cl. 204-38.400.

Harrington Tool Company: *See*—
Abrahamson, Thomas C., 4,505,386, Cl. 206-315.110.

Harris Corporation: *See*—
McGann, William E., 4,506,383, Cl. 455-17.000.

Harris, David J., to Raytheon Company. Comparator circuit. 4,506,176, Cl. 307-557.000.

Harry Major Machine and Tool Co.: *See*—
Major, Harry, 4,505,381, Cl. 198-781.000.

Hartke, Charles A.; and Brummer, Francis A., to Farmweld, Inc. Feeder for small pigs. 4,505,227, Cl. 119-52.00R.

Hartlage, Jurgen, to H. Wohlenberg KG GmbH & Co. Three-knife cutting machine. 4,505,173, Cl. 83-112.000.

Hartman, Susan E.; Allen, Michael E.; and Pascoe, William E., to Eastman Kodak Company. Cycloalkylsulfonates, polymers and processes relating to same. 4,506,094, Cl. 560-118.000.

Harvey, Donald M., to Eastman Kodak Company. Apparatus for transferring pre-recorded image signal information from one recording medium to a master recording medium. 4,506,304, Cl. 360-14.300.

Hasegawa, Akio: *See*—
Mori, Toshihito; Yoshizaki, Hideo; and Hasegawa, Akio, 4,505,893, Cl. 424-94.000.

Hasegawa, Shin-ich; Takano, Eiji; and Sekine, Masao, to Mitsubishi Nuclear Fuel Co., Ltd. Process for manufacturing uranium dioxide powder. 4,505,882, Cl. 423-261.000.

Hasegawa, Takanori; and Shimada, Takanobu, to Riso Kagaku Corporation. System for retaining stencil printing master on printing drum by clamp strip hinged along drum generator. 4,505,199, Cl. 101-127.100.

Hasegawa, Tatsumi: *See*—
Maekawa, Masashi; and Hasegawa, Tatsumi, 4,506,315, Cl. 362-308.000.

Hasegawa, Yuzo; and Shimoda, Naokazu, to Brother Kogyo Kabushiki Kaisha. Ribbon cartridge. 4,505,605, Cl. 400-208.000.

Hasenauer, Dieter; and Reiss, Harald, to Brown, Boveri & Cie AG. Thermal insulation. 4,505,977, Cl. 428-363.000.

Hashimoto, Takaaki, to Nippon Kogaku K.K. White balancing apparatus for color television cameras. 4,506,290, Cl. 358-29.000.

Hashimoto, Toyokazu: *See*—
Nakayashiki, Susumu; Kida, Masahiko; and Hashimoto, Toyokazu, 4,506,357, Cl. 370-16.000.

Haskel, Inc.: *See*—
Kelly, John W., 4,505,142, Cl. 72-54.000.

Hasselmann, Heinz: *See*—
Karpe, Wolfgang; Kluge, Johannes; and Hasselmann, Heinz, 4,506,242, Cl. 335-120.000.

Hasuo, Shinya, to Fujitsu Limited. Decoder circuit utilizing josephson devices. 4,506,172, Cl. 307-462.000.

Hatazi, Masahiko: *See*—
Tanigawa, Takatoshi; Yaegashi, Sakari; Nakazawa, Tetsuo; Hatazi, Masahiko; and Nango, Tadao, 4,506,041, Cl. 523-139.000.

Hatton, Leslie R.; Parnell, Edgar W.; and Roberts, David A., to May & Baker Limited. Herbicidal 5-amino-4-cyano-1-phenyl-pyrazoles. 4,505,740, Cl. 71-92.000.

Haus, Hermann A.; Kirsch, Steven T.; and Leonberger, Frederick J., to Massachusetts Institute of Technology. Picosecond optical sampling. 4,505,587, Cl. 356-345.000.

Hauschopp, Alois, to Gewerkschaft Eisenhutte Westfalia. Mineral winning machines. 4,505,518, Cl. 299-34.000.

Hay, Robert A., II, to Dow Chemical Company, The. Apparatus for the flexibilization of synthetic resinous foam. 4,505,662, Cl. 425-329.000.

Hayakawa, Yasumitsu: *See*—
Endoh, Kunihisa; and Hayakawa, Yasumitsu, 4,506,238, Cl. 333-138.000.

Hayashi, Hiroshi: *See*—
Takaki, Hideki; Hayashi, Hiroshi; Ono, Shigetoshi; and Okamura, Hisashi, 4,506,002, Cl. 430-215.000.

Hayashi, Kazuya: *See*—
Togawa, Hideo; Takezawa, Taihei; Watanabe, Masazumi; Hayashi, Kazuya; and Okuhara, Akira, 4,505,938, Cl. 426-46.000.

Hayashi, Masaharu: *See*—
Tsuchikawa, Shunzo; Hayashi, Masaharu; and Hori, Takanobu, 4,505,641, Cl. 416-189.000.

Hayashi, Shozo: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,506,107, Cl. 174-25.00C.

Hayba, Franklin P., to ASP International, Inc. Fire extinguisher handle securing apparatus. 4,505,335, Cl. 169-76.000.

Hayner, Paul F., to Sanders Associates, Inc. Magnetic heading transducer having dual-axis magnetometer with electromagnet mounted to permit pivotal vibration thereof. 4,506,221, Cl. 324-256.000.

Hays, Dan: *See*—
Brewington, Grace T.; Bolte, Steven B.; Hays, Dan; and Wayman, William H., 4,505,573, Cl. 355-3.0DD.

Hazama, Junji: *See*—
Hada, Kazunari; Fujii, Norio; Kawahara, Atsushi; Azuma, Toru; and Hazama, Junji, 4,506,382, Cl. 382-27.000.

Hazen, Craig B., to Northwest Alaskan Pipeline Company. Heat pipes with shrouded fins and fan. 4,505,326, Cl. 165-45.000.

Healy, Leonard D., to United States of America, Navy. Simulator interface system. 4,506,324, Cl. 364-200.000.

Heavner, George: *See*—
Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, 4,505,853, Cl. 260-112.50R.

Heckler & Koch GmbH: *See*—
Thevis, Paul; and Moller, Tilo, 4,505,336, Cl. 169-85.000.

Hedlund, Bo P. S.; and Arnoldsson, Eric, to Kockums Industri AB. Wheeled working vehicle with crane. 4,505,396, Cl. 212-223.000.

Heede International Ltd.: *See*—
Bagaric, Stjepan; and Pietsch, Gunter, 4,505,207, Cl. 105-163.0SK.

Heenan, Sidney A., to Amerace Corporation. Mobile testing apparatus. 4,505,590, Cl. 356-445.000.

Heffner, William R.: *See*—
Berreman, Dwight W.; and Heffner, William R., 4,505,548, Cl. 350-346.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Advanced epoxy resins containing triazine or both triazine and oxazoline groups. 4,506,063, Cl. 528-96.000.

Heger, Werner; Kaltenthaler, Wolfgang; and Wilke, Helmut, to WABCO Fahrzeugbremsen GmbH. Unloading mechanisms for air compressors. 4,505,648, Cl. 417-297.000.

Heimnick, Paul, to Schmelzer Corporation. Vacuum control device. 4,505,237, Cl. 123-179.00G.

Heinen, Raymond; and Stelling, Horst, to Leybold Heraeus GmbH. Mass spectrometer. 4,506,227, Cl. 328-33.000.

Heinrich, Kurt: *See*—
Wilking, Hans; Heinrich, Kurt; and Peetz, Walter, 4,505,515, Cl. 297-362.000.

Heisler, Raymond A. Apparatus for engaging and moving corrugated paperboard portions by reciprocated pins. 4,505,468, Cl. 271-18.300.

Helena Laboratories, Inc.: *See*—
Golias, Tipton L., 4,505,557, Cl. 350-536.000.

Heller, Monika: *See*—
Wolters, Johannes; David, Paul-Johannes; and Heller, Monika, 4,505,875, Cl. 376-283.000.

Hellewell, Todd D., to Combustion Engineering, Inc. Apparatus for removal of troublesome mineral matter from pulverized coal. 4,505,435, Cl. 241-79.100.

Hemmerich, Heinz-Peter; Schulte-Huermann, Werner; and Dohm, Heinz, to Bayer Aktiengesellschaft. Process for the preparation of o-benzylphenol. 4,506,103, Cl. 568-744.000.

Henderson, Drew R.: *See*—
Rice, Richard M.; Watling, Robert E.; and Henderson, Drew R., 4,506,146, Cl. 219-499.000.

Henderson, James N.; Donbar, Ken W.; Barbour, John J.; and Bell, Anthony J., to Goodyear Tire & Rubber Company, The. Microencapsulated aqueous polymerization catalyst. 4,506,031, Cl. 502-162.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Dierichs, Wolfgang; Eberhardt, Werner; and Wegner, Jurgen, 4,505,964, Cl. 428-85.000.

Henquin, Teodor; and Zeev, Ya'acov B., to Electronics Corporation of Israel Ltd. TAS! Apparatus for use with systems having interregister multifrequency signalling. 4,506,359, Cl. 370-81.000.

Herbertz, Toni: *See*—
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Uhlemann, Hans, 4,505,870, Cl. 264-206.000.

Herbstman, Sheldon: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; Herbstman, Sheldon; and Dorn, Peter, 4,505,835, Cl. 252-51.50A.

Herbulot, Jean; and Jumel, Bernard, to VALEO. Twin-disc brake having axially sliding calipers. 4,505,363, Cl. 188-72.500.

Herchenbach, Horst; Seelen, Fritz; Ramesohl, Hubert; Hundgen, Peter; and Schilling, Horst, to Klockner-Humboldt-Deutz AG. Cyclone heat exchanger including segmented immersion pipe. 4,505,051, Cl. 34-57.00E.

Hercules Incorporated: *See*—
Dasgupta, Sunil P., 4,505,990, Cl. 428-694.000.

Hergenrother, William L.; and Doshak, John M., to Firestone Tire & Rubber Company, The. Polyethylene terephthalate molding compositions. 4,506,050, Cl. 524-143.000.

Hermann Hemscheidt Maschinenfabrik GmbH & Co.: *See*—
Welzel, Josef; and Krieger, Karl, 4,505,299, Cl. 137-596.100.

Hermann Huster GmbH & Co.: *See*—
Lieber, Hans-Wilhelm; and Kammel, Roland, 4,505,958, Cl. 427-433.000.

Herold, Barry W.: *See*—
Little, Wendell L.; and Herold, Barry W., 4,506,167, Cl. 307-279.000.

Herrmann, Wolfgang; and Gebhardt, Uwe, to Warner-Lambert Company. Process for preparing microcrystalline isoxicam. 4,506,071, Cl. 544-49.000.

Herron, Claudia S.: *See*—
Herron, Robert G.; and Herron, Claudia S., 4,504,992, Cl. 5-507.000.

Herron, Robert G.; and Herron, Claudia S. Hospital bed telephone holder. 4,504,992, Cl. 5-507.000.

Hershberger, Charles L.; Radue, Anna K.; and Rosteck, Paul R., Jr., to Eli Lilly and Company. Stabilizing and selecting recombinant DNA host cells. 4,506,013, Cl. 435-172.300.

Herzfeld, David: *See*—
Bowden, Wade R., Jr.; and Herzfeld, David, 4,505,403, Cl. 220-242.000.

Hesford, Frank W.; Lampe, Jerome L.; and Szekely, Paul, to Cincinnati Milacron Inc. Control for radiant heating. 4,506,144, Cl. 219-497.000.

Hesselbrock, Bernd: *See*—
Rott, Joachim; Thelen, Wolfgang; and Hesselbrock, Bernd, 4,506,353, Cl. 367-91.000.

Hewitt, Delbert C.: *See*—
Fasolino, Gabriel V., 4,505,001, Cl. 15-250.00A.

Hibino, Takashi; Naruse, Nobutaka; and Yoshida, Kazuhiro, to Hoshizaki Electric Co., Ltd. Ice making machine. 4,505,130, Cl. 62-347.000.

Hidaka, Hideo: *See*—
Kurushima, Tadanori; Hidaka, Hideo; and Sonoda, Hiroyoshi, 4,505,101, Cl. 57-301.000.

Higuchi, Mitsuo, to Fujitsu Limited. CMIS Level shift circuit. 4,506,164, Cl. 307-264.000.

Higuchi, Toshiaki: *See*—
Chijiishi, Toshio; Matoba, Hiroshi; Nakamura, Kazuo; and Higuchi, Toshiaki, 4,505,659, Cl. 425-121.000.

Hildebrand, Reinhard; and Waldmann, Bernd, to Siemens Aktiengesellschaft. Slider control. 4,505,324, Cl. 165-42.000.

Hilfiker, Arthur L.: *See*—
Hilfiker, Harold K.; and Hilfiker, Arthur L., 4,505,621, Cl. 405-284.000.

Hilfiker, Harold K.; and Hilfiker, Arthur L., to Hilfiker Pipe Co. Wire retaining wall apparatus and method for earthen formations. 4,505,621, Cl. 405-284.000.

Hilfiker Pipe Co.: *See*—
Hilfiker, Harold K.; and Hilfiker, Arthur L., 4,505,621, Cl. 405-284.000.

Hill, Arthur S.: *See*—
Doehnert, Donald F.; and Hill, Arthur S., 4,505,976, Cl. 428-355.000.

Hill, Edward C., to United Technologies Corporation. Rotor blade interplatform seal. 4,505,642, Cl. 416-193.00A.

Himeno, Kiyoshi: *See*—
Niwa, Toshio; Himeno, Kiyoshi; and Yoshihara, Junji, 4,505,715, Cl. 8-639.000.

Hinchcliffe, Dennis; and Wright, Anthony P., to Molins PLC. Packing machine control. 4,505,091, Cl. 53-444.000.

Hine, Jean-Patrick; and McGaffigan, Thomas H., to Raychem Corporation. Array package connector. 4,505,532, Cl. 339-75.00M.

Hinrichs, James O., to Fike Metal Products Corporation. High reverse pressure resistant low forward burst pressure rupture disc assembly. 4,505,180, Cl. 89-8.000.

Hirai, Osamu: *See*—
Mukoyama, Yoshiyuki; Hirai, Osamu; and Aoyama, Tetsuya, 4,505,818, Cl. 210-502.100.

Hirai, Seiji, to Kabushiki Kaisha Hirai Tekkosho. Jig apparatus for use with industrial robots. 4,505,463, Cl. 269-56.000.

Hirakawa, Osamu, to Nippon Piston Ring Co., Ltd. Rotary seal with linear wear resistant treated layer. 4,505,485, Cl. 277-96.100.

Hiratsuka, Yutaka: *See*—
Tochigi, Kenji; Hanyu, Yoshiaki; and Hiratsuka, Yutaka, 4,505,586, Cl. 356-301.000.
Hird, Edwin A. Point location and graphics display apparatus. 4,506,336, Cl. 364-518.000.
Hirohata, Michio; and Kodaira, Takanori, to Canon Kabushiki Kaisha. Electromagnetically driven shutter with focus adjusting function. 4,505,567, Cl. 354-403.000.
Hirose, Toru: *See*—
Miyata, Shigeo; Okada, Akira; and Hirose, Toru, 4,505,887, Cl. 423-635.000.
Hirsbrunner, Pierre: *See*—
Bertholet, Raymond; and Hirsbrunner, Pierre, 4,506,080, Cl. 548-504.000.
Hiruta, Masaru: *See*—
Fukuda, Hiroyuki; Kaji, Hisatsugu; Fujimaki, Hiroto; Yamanobe, Yoichiro; Hiruta, Masaru; and Ohmi, Sigeru, 4,506,028, Cl. 502-101.000.
Hisajima, Masahiko: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; and Shigemura, Yutaka, 4,505,571, Cl. 355-3.0SH.
Hitachi Chemical Co., Ltd.: *See*—
Mukoyama, Yoshiyuki; Hirai, Osamu; and Aoyama, Tetsuya, 4,505,818, Cl. 210-502.100.
Nishizawa, Hiroshi; Mukoyama, Yoshiyuki; Kasai, Shozo; and Okada, Yasunori, 4,505,980, Cl. 428-383.000.
Hitachi Heating Appliances Co., Ltd.: *See*—
Satoh, Kenji, 4,506,127, Cl. 219-10.55B.
Hitachi, Ltd.: *See*—
Chinone, Naoki; Kashiwada, Yasutoshi; Yamashita, Shigeo; and Aiki, Kunio, 4,506,366, Cl. 372-45.000.
Funabashi, Kiyomi; Kawamura, Fumio; Kikuchi, Makoto; and Yusa, Hideo, 4,505,851, Cl. 252-628.000.
Itoh, Masahiko; Midorikawa, Heihatiro; Minato, Akira; Kubo, Mituru; Ito, Takehiko; and Katayama, Kiichiro, 4,505,760, Cl. 148-6.15R.
Kimura, Tomoaki, 4,505,319, Cl. 164-432.000.
Kobayashi, Nobuyoshi; Iwata, Seiichi; Yamamoto, Naoki; Matsuo, Hitoshi; and Homma, Teiichi, 4,505,028, Cl. 29-578.000.
Matsumura, Hiroyoshi; Katsuyama, Toshio; and Suganuma, Tsuneo, 4,505,729, Cl. 65-3.110.
Nagumo, Shuzo; Ogura, Setsuo; and Kitamura, Yukinori, 4,505,766, Cl. 148-175.000.
Nakayashiki, Susumu; Kida, Masahiko; and Hashimoto, Toyokazu, 4,506,357, Cl. 370-16.000.
Shizuka, Masayuki; Ogasawara, Nobuhiko; Kanamaru, Hisznobu; and Tsuruoka, Kazuhiro, 4,506,180, Cl. 310-91.000.
Sugihara, Isao; Sagawa, Wataru; Ikegami, Tsukasa; and Shimizu, Tasuku, 4,505,763, Cl. 148-127.000.
Takenouchi, Hiroo; Ishida, Hideaki; and Hiyama, Kunio, 4,506,111, Cl. 179-2.00A.
Tanigawa, Takatoshi; Yaegashi, Sakari; Nakazawa, Tetsuo; Hatazi, Masahiko; and Nango, Tadao, 4,506,041, Cl. 523-139.000.
Tochigi, Kenji; Hanyu, Yoshiaki; and Hiratsuka, Yutaka, 4,505,586, Cl. 356-301.000.
Umeda, Takao; Simazaki, Yuzuru; Igawa, Tatsuo; Tanno, Seikichi; Sasaki, Ken; and Miyashita, Takao, 4,505,546, Cl. 350-334.000.
Usami, Kenichi; Kirihara, Seishin; Doi, Hiroyuki; Asano, Choichi; Sukekawa, Masayuki; and Sakaguchi, Yasuhide, 4,505,232, Cl. 122-511.000.
Hitachi Metals, Ltd.: *See*—
Furuichi, Shinji; Morita, Shigetoshi; Taka, Shunichi; and Suwabe, Hirohisa, 4,506,308, Cl. 360-121.000.
Hitachi Microcomputer Engineering, Ltd.: *See*—
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Hitt, James J., to General Signal Corporation. Square root circuit with stable linear cut-off. 4,506,174, Cl. 307-490.000.
Hiyama, Kunio: *See*—
Takenouchi, Hiroo; Ishida, Hideaki; and Hiyama, Kunio, 4,506,111, Cl. 179-2.00A.
Ho, Guan-Huei; and Liao, Chiang-Chang, to Borden Company Limited. Multi-layer immobilized enzyme compositions. 4,506,015, Cl. 435-175.000.
Hobart Corporation: *See*—
Bowers, Russell E.; and Trieber, Fritz F., 4,505,092, Cl. 53-504.000.
Hobbs, John; and Schrader, Wolfgang, to Robert Bosch GmbH. Multi-axle vehicle. 4,505,344, Cl. 177-136.000.
Hodgdon, Russell B.; and Waite, Warren A., to Ionics, Incorporated. Ion-exchange membranes reinforced with non-woven carbon fibers. 4,505,797, Cl. 204-252.000.
Hodges, David R.: *See*—
Grzelka, Andrew; Hodges, David R.; and Ruckdeschel, Lawrence M., 4,505,616, Cl. 405-198.000.
Hodgkins, Charles E.; Rose, Daniel C.; and Coller, Dana L., to TAM Ceramics, Inc. Low firing ceramic dielectric for temperature compensating capacitors. 4,506,026, Cl. 501-135.000.
Hoechst Aktiengesellschaft: *See*—
Becker, Reinhold; and Michel, Wolfgang, 4,505,003, Cl. 17-41.000.
Esser, Karl; and Minuth, Walter, 4,506,014, Cl. 435-172.300.
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Hultzsch, Kurt; and Rudolphy, Albert, 4,506,059, Cl. 525-134.000.
Ruckert, Hans; Buhr, Gerhard; and Steppan, Hartmut, 4,506,003, Cl. 430-270.000.
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Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, 4,505,849, Cl. 252-609.000.
Hoesch AG: *See*—
Wolzenburg, Heinrich, 4,505,525, Cl. 384-565.000.
Hoffman, Jacob M., Jr.; and Wolterstorf, Otto W., Jr., to Merck & Co., Inc. Ethers of hydroxybenzothiazole-2-sulfonamide for the topical treatment of elevated intraocular pressure. 4,505,923, Cl. 514-229.000.
Hoffman, John R.: *See*—
Woodruff, Frank; Ferguson, John H., Jr.; and Hoffman, John R., 4,505,108, Cl. 60-327.000.
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Hoffmann, Rainer: *See*—
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Hofmann, Dieter; and Weinhardt, Erolf, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Lamp filament structure, and method of its manufacture. 4,506,187, Cl. 313-341.000.
Hoh, Thomas G.; Friedman, Bernard L.; Borchert, Wendall; and Nixon, Eugene H., Jr., to Advanced Pumping Systems, Inc. Oil well pumping apparatus and method. 4,505,162, Cl. 74-41.000.
Hoheisel, Klaus, to Hoechst Aktiengesellschaft. Shaped body having good long-term thermal stability and containing fluorohydrocarbon polymers. 4,505,982, Cl. 428-421.000.
Hokamura, Sadakazu; Shinohara, Toshio; Nomura, Ryoichi; Aritomi, Mitsutoshi; and Yoshida, Yuji, to Dai Nippon Toryo Co., Ltd.; and Mitsubishi Yuka Fine Chemicals Co., Ltd. Process for forming a corrosion resistant high-build type coating. 4,505,954, Cl. 427-380.000.
Holden, Joseph T.; and Christensen, Finn. Thrust tube propulsion system. 4,505,684, Cl. 440-38.000.
Holldorff, Gunther: *See*—
Malewski, Werner; and Holldorff, Gunther, 4,505,133, Cl. 62-476.000.
Hollenstein, Helmut: *See*—
Rock, Erich; and Hollenstein, Helmut, 4,505,610, Cl. 403-231.000.
Hollingshead, Ethan A.: *See*—
Huni, Jean-Paul R.; Hollingshead, Ethan A.; Edgeworth, Thomas G.; Sood, Raman R.; Dewing, Ernest W.; and Rogers, Charles J., 4,505,796, Cl. 204-243.00R.
Holman, Edward C.: *See*—
Fink, Carl M.; and Holman, Edward C., 4,505,190, Cl. 98-115.100.
Holt, Anne; and Krutzler, James, to Celanese Corporation. Extrusion coating apparatus. 4,505,222, Cl. 118-304.000.
Holter Regelarmaturen GmbH & Co. Kg: *See*—
Wullenkord, Kurt, 4,505,865, Cl. 261-44.00R.
Homersen, Achim: *See*—
Boos, Jurgen; Homersen, Achim; and Schirmag, Klaus-Peter, 4,505,692, Cl. 474-111.000.
Homma, Teiichi: *See*—
Kobayashi, Nobuyoshi; Iwata, Seiichi; Yamamoto, Naoki; Matsuo, Hitoshi; and Homma, Teiichi, 4,505,028, Cl. 29-578.000.
Honaga, Susumu; and Sutoh, Satoshi, to Toyoda Koki Kabushiki Kaisha. Vane pump with positioning pins for cam ring and side plates. 4,505,655, Cl. 418-133.000.
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Ariga, Yoshio; Ishige, Yoshiki; Satoh, Shogi; Tegawa, Masao; Kinugasa, Toshiyuki; and Yamamoto, Toru, 4,505,774, Cl. 156-499.000.
Fukamachi, Masaaki; and Sueyoshi, Masahiko, 4,506,216, Cl. 324-166.000.
Nakajima, Toyohei; and Hosokawa, Takehiko, 4,505,246, Cl. 123-489.000.
Nishikawa, Masao; and Aoki, Takashi, 4,505,351, Cl. 180-169.000.
Onda, Takanori; and Saito, Takeo, 4,505,352, Cl. 180-219.000.
Sakuma, Kazuyoshi; Nihei, Tetsuo; and Maki, Toshio, 4,505,144, Cl. 72-345.000.
Sano, Shoichi; and Furukawa, Yoshimi, 4,505,491, Cl. 280-91.000.
Tsunoda, Kazuhiko, 4,505,492, Cl. 280-284.000.
Urano, Shigeru; Yamamoto, Kiyoshi; Takagi, Yoshiaki; and Sugawara, Takeshi, 4,505,988, Cl. 428-569.000.
Honda Piston Ring Co., Ltd.: *See*—
Urano, Shigeru; Yamamoto, Kiyoshi; Takagi, Yoshiaki; and Sugawara, Takeshi, 4,505,988, Cl. 428-569.000.
Honeywell Inc.: *See*—
Brady, D. Ward; and Chapman, James F., 4,505,203, Cl. 102-382.000.
Daughton, James M., 4,506,139, Cl. 219-209.000.
Jaeger, Thomas S., 4,505,300, Cl. 137-614.140.
Honeywell Information Systems Inc.: *See*—
Boothroyd, Donald C.; and Norman, Robert W., Jr., 4,506,345, Cl. 364-900.000.
Circello, Joseph C.; Howell, Thomas H.; and Edgington, Gregory C., 4,506,340, Cl. 364-746.000.
Genuit, Luther L.; and Nowell, John R., 4,506,256, Cl. 340-518.000.
Honeywell Information Systems Italia: *See*—
Ferrari, Gianpietro, 4,506,207, Cl. 318-696.000.
Hong Le, Da, to Transamerica DeLaval Inc. Transducers with quick dome connect systems. 4,505,157, Cl. 73-756.000.
Hoover Universal, Inc.: *See*—
Craig, Walter J., 4,505,664, Cl. 425-525.000.
Hope, Douglas A.: *See*—
Bell, James A. E.; Conard, Bruce R.; and Hope, Douglas A., 4,505,060, Cl. 40-27.500.

Hope, Lawrence L.; and Plumb, John L., to GTE Products Corporation. Thin film electroluminescent display. 4,506,193, Cl. 315-169.300.

Hori, Takanobu: *See—*
Tsuchikawa, Shunzo; Hayashi, Masaharu; and Hori, Takanobu, 4,505,641, Cl. 416-189.000.

Horiguchi, Fumio: *See—*
Kurosawa, Kei; and Horiguchi, Fumio, 4,505,025, Cl. 29-576.00W.

Horrmann, Wilhelm. Fatty aldehydes in the treatment of Multiple Sclerosis. 4,505,933, Cl. 514-693.000.

Horton, Roger L., to Smith International Inc. Prepackaged crosslinked polymer. 4,505,826, Cl. 252-8.55R.

Hoshizaki Electric Co., Ltd.: *See—*
Hibino, Takashi; Naruse, Nobutaka; and Yoshida, Kazuhiro, 4,505,130, Cl. 62-347.000.

Hosler, John F., to Formica Corporation. Decorative laminate having mar-resistant surface. 4,505,974, Cl. 428-329.000.

Hosokawa, Takehiko: *See—*
Nakajima, Toyohei; and Hosokawa, Takehiko, 4,505,246, Cl. 123-489.000.

Hotier, Gerard: *See—*
Deschamps, Andre ; Cosyns, Jean; Le Page, Jean-Francois; and Hotier, Gerard, 4,505,880, Cl. 423-219.000.

Houdaille Industries, Inc.: *See—*
Schultz, John C., 4,505,458, Cl. 267-9.00B.

House, David W., to UOP Inc. Electrically conducting polymers. 4,505,845, Cl. 252-500.000.

House, David W.; and Swedo, Raymond J., to UOP Inc. Electrically conducting polymers. 4,505,846, Cl. 252-500.000.

Houston, John M., to General Electric Company. High power cesium lamp system for laser pumping. 4,506,369, Cl. 372-72.000.

Howe, Gary L.: *See—*
Bennett, James W.; Howe, Gary L.; Jaakola, Kenneth A.; and Koutavas, Samuel G., 4,506,138, Cl. 219-205.000.

Howell, Thomas H.: *See—*
Circello, Joseph C.; Howell, Thomas H.; and Edgington, Gregory C., 4,506,340, Cl. 364-746.000.

Howes, James P.; and Richardson, James E., to J. P. Howes Productions. Display cooler. 4,505,132, Cl. 62-457.000.

Howmet Turbine Components Corporation: *See—*
Smickley, Robert J.; and Dardi, Louis E., 4,505,764, Cl. 148-133.000.

Hoyer, Gale G.: *See—*
Sumner, William C., Jr.; Hoyer, Gale G.; and Kozak, William G., 4,505,885, Cl. 423-592.000.

Hoyois, Jean-Claude: *See—*
Toussaint, Francois; and Hoyois, Jean-Claude, 4,505,538, Cl. 350-357.000.

Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., to Mobil Oil Corporation. Multistage process for converting oxygenates to distillate hydrocarbons with interstage ethene recovery. 4,506,106, Cl. 585-312.000.

Hsing, Frederick F.; and Leogrande, John A., to United Technologies Corporation. Seal means for a blade attachment slot of a rotor assembly. 4,505,640, Cl. 416-97.00R.

Hsu, Li-Chen; Philipp, Warren H.; Sheibley, Dean W.; and Gonzalez-Sanabria, Olga D., to United States of America, National Aeronautics and Space Administration. Alkaline battery containing a separator of a cross-linked copolymer of vinyl alcohol and unsaturated carboxylic acid. 4,505,998, Cl. 429-206.000.

Huang, Min N.; and Brethorst, David L., to DEC International, Inc. Enclosed floor track system. 4,505,205, Cl. 104-139.000.

Hubbard, David W., to Pitney Bowes Inc. Hand held electronic postage meter having secure postage meter doors. 4,506,344, Cl. 364-900.000.

Huber, William J.; and Borck, Gordan T., to RTE Corporation. Fuse element termination for current-limiting fuse. 4,506,249, Cl. 337-232.000.

Huff, Joel R.; Saari, Walfred S.; and Baldwin, John J., to Merck & Co., Inc. 4-[2-Pyridinylthio(oxy or amino)methyl]-1H-imidazoles and derivatives. 4,505,918, Cl. 514-341.000.

Huff, Joel R.; Saari, Walfred S.; and Baldwin, John J., to Merck & Co., Inc. 2-[2-Pyridinyloxy(thio or amino)methyl]-1H-imidazoles and derivatives. 4,506,074, Cl. 546-278.000.

Huffman, David C., to Spraco, Inc. Apparatus for discharging three commingled fluids . 4,505,431, Cl. 239-428.000.

Hughes, Robert W.; and Cantrel, James F., to Ingersoll-Rand Company. Plural-part earth bit, and an improved bit head therefor. 4,505,343, Cl. 175-409.000.

Hughey, Daniel C.: *See—*
Woodruff, Frederick W.; Hughey, Daniel C.; and Smart, William L., 4,506,260, Cl. 340-649.000.

Hugon, Pierre: *See—*
Beregi, Laszlo; Hugon, Pierre; Duhault, Jacques; and Boulanger, Michelle, 4,505,921, Cl. 514-212.000.

Huh, Phil-yool. Bedroom cabinet. 4,505,078, Cl. 52-36.000.

Huignard, Jean-Pierre; and Marrakchi El Fellah, Abdellatif, to Thomson-CSF. Optical device for real-time amplification of the radiant energy of a beam. 4,505,536, Cl. 350-3.640.

Hultzsch, Kurt; and Rudolphy, Albert, to Hoechst Aktiengesellschaft. Process for the preparation of a modified hydrocarbon resin. 4,506,059, Cl. 525-134.000.

Hum, Robert H.: *See—*
MacDonald, R. Ian; Hara, Elmer H.; and Hum, Robert H., 4,506,151, Cl. 250-213.00A.

Hundgen, Peter: *See—*
Herchenbach, Horst; Seelen, Fritz; Ramesohl, Hubert; Hundgen, Peter; and Schilling, Horst, 4,505,051, Cl. 34-57.00E.

Hung, Chi-Wen: *See—*
Imai, Tamotsu; and Hung, Chi-Wen, 4,506,032, Cl. 502-223.000.

Huni, Jean-Paul R.; Hollingshead, Ethan A.; Edgeworth, Thomas G.; Sood, Raman R.; Dewing, Ernest W.; and Rogers, Charles J., to Alcan International Limited. Electrolytic reduction cells. 4,505,796, Cl. 204-243.00R.

Hunt, Patricia K.; and Waisala, Steven J., to Standard Oil Company, The. Mineral sample preservation process. 4,505,161, Cl. 73-863.000.

Hunter, Billy D. Modular passive solar heating system. 4,505,261, Cl. 126-433.000.

Hurri-Kleen Corporation: *See—*
Kyatt, Victor F., 4,505,284, Cl. 134-104.000.

Hurst, Robert N., Jr., to RCA Corporation. Independent fleshtone contours. 4,506,293, Cl. 358-37.000.

Husain, Syed, to National Semiconductor Corporation. Self-aligning apparatus for semiconductor lead frame processing means. 4,505,225, Cl. 118-669.000.

Hutchison, James M. S.: *See—*
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,506,222, Cl. 324-309.000.

I M L Corporation: *See—*
Gagliani, John; Sorathia, Usman A. K.; and Lee, Raymond, 4,506,038, Cl. 521-103.000.

Ichikawa, Masaru, to Sagami Chemical Research Center. Process for producing oxygen-containing hydrocarbon compounds. 4,506,033, Cl. 518-716.000.

Ichikawa, Masashi; Saito, Toru; and Nishi, Takeshi, to Nippon Steel Corporation. Flash butt welding method. 4,506,134, Cl. 219-100.000.

Ichikawa, Yoshio; and Ohyagi, Takashi, to NEC Corporation. Battery saver for a paging receiver or the like . 4,506,386, Cl. 455-343.000.

Ichikoh Industries, Ltd.: *See—*
Maekawa, Masashi; and Hasegawa, Tatsumi, 4,506,315, Cl. 362-308.000.

ICI Americas Inc.: *See—*
Bristowe, William W.; and Ford, Ernest C., Jr., 4,506,055, Cl. 525-424.000.
Robertson, John R., 4,505,778, Cl. 162-135.000.

ICI Australia Limited: *See—*
Barnett, George H.; and Markus, Michael V., 4,506,035, Cl. 521-53.000.

Idea Development Corporation: *See—*
Allison, Robert A., 4,505,445, Cl. 244-134.00B.

Idler, Horst: *See—*
Bloch, Samuel; Bressler, Klaus; Idler, Horst; and Kleiber, Herbert, 4,506,332, Cl. 364-483.000.

Igarashi, Tatsuo: *See—*
Harada, Tsuneo; Takemoto, Hisao; and Igarashi, Tatsuo, 4,506,011, Cl. 435-70.000.

Igawa, Tatsuo: *See—*
Umeda, Takao; Simazaki, Yuzuru; Igawa, Tatsuo; Tanno, Seikichi; Sasaki, Ken; and Miyashita, Takao, 4,505,546, Cl. 350-334.000.

Ihbe, Jorg; Taubenmann, Peter; Thiele, Heino; and Zettler, Hans-Dieter, to BASF Aktiengesellschaft. Apparatus for producing a mixture from two or more plastic components. 4,505,592, Cl. 366-134.000.

IHC Holland N.V.: *See—*
Stigter, Jan, 4,505,215, Cl. 114-29.000.

Iizuka, Yasuhiro: *See—*
Shimada, Masayoshi; Komagata, Hideki; and Iizuka, Yasuhiro, 4,505,994, Cl. 429-101.000.

Ikeda, Hideo: *See—*
Sugimoto, Tadao; and Ikeda, Hideo, 4,506,008, Cl. 430-502.000.

Ikeda, Toshiaki: *See—*
Kuno, Toshitaka; and Ikeda, Toshiaki, 4,505,049, Cl. 33-333.000.

Ikegami, Tsukasa: *See—*
Sugihara, Isao; Sagawa, Wataru; Ikegami, Tsukasa; and Shimizu, Tasuku, 4,505,763, Cl. 148-127.000.

Ikeya, Nobushige, to Mitsubishi Kasei Kogyo Kabushiki Kaisha. Apparatus for forming blown films. 4,505,657, Cl. 425-72.00R.

Ilecard Pty. Limited: *See—*
Lees, Jeremy J., 4,505,812, Cl. 209-275.000.

Imai, Takayoshi: *See—*
Isogai, Sakichi; Mizuhata, Teruo; Takahashi, Masaaki; Imai, Takayoshi; Nakanishi, Kazuyoshi; Ito, Takefumi; and Koshihara, Atsuo, 4,505,397, Cl. 212-232.000.

Imai, Tamotsu; and Hung, Chi-Wen, to UOP Inc. Dehydrogenation catalyst composition. 4,506,032, Cl. 502-223.000.

Imdec S.R.L.: *See—*
Silvestrini, Jesus A.; and Morsucci, Juan C., 4,505,670, Cl. 432-124.000.

IMEC Corporation: *See—*
Comstock, Robert H.; Curtiss, William P.; and Fulton, Donald E., 4,506,321, Cl. 364-174.000.

Imperial Chemical Industries PLC: *See—*
Kay, Ian T.; and Noon, Robert A., 4,506,084, Cl. 549-74.000.

Inaba, Norihiko: *See—*
Sakamoto, Hiroshi; Inaba, Norihiko; and Taniguchi, Keishi, 4,506,278, Cl. 346-216.000.

Inada, Nichimu. Portable massaging device. 4,505,267, Cl. 128-49.000.

Inami, Yasuhiko: *See—*
Hamada, Hiroshi; Take, Hiroshi; Yano, Kozo; and Inami, Yasuhiko, 4,505,021, Cl. 29-570.000.

Inatani, Toshihiro: *See*—
Hamada, Takao; Tsuchiya, Nobuo; Ito, Yo; Inatani, Toshihiro; Takada, Yoshiyasu; Sumito, Mitsuo; Koitabashi, Toshimitsu; and Katayama, Hideshi, 4,505,745, Cl. 75-129.000.
Inco Limited: *See*—
Bell, James A. E.; Conard, Bruce R.; and Hope, Douglas A., 4,505,060, Cl. 40-27.500.
Incorvia, Samuel A.: *See*—
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,505,727, Cl. 55-387.000.
Inductotherm Industries Inc.: *See*—
Boehm, Paul C.; Mortimer, John H.; Rowan, Henry M.; and Turner, Robert C., 4,506,131, Cl. 219-10.770.
Industries P. H. L., Inc.: *See*—
Hamel, Gerald, 4,505,176, Cl. 83-808.000.
Ingersoll-Rand Company: *See*—
Hughes, Robert W.; and Cantrel, James F., 4,505,343, Cl. 175-409.000.
Murphy, Bernard J., 4,505,349, Cl. 180-136.000.
Innis, Peter: *See*—
Pronovost, Richard; Innis, Peter; and O'Rourke, Leo M., 4,505,127, Cl. 62-271.000.
Inokuchi, Toshiyuki, to Ricoh Company, Ltd. Image-forming optical system. 4,505,570, Cl. 355-3.00R.
Inomata, Kenichi, to Diesel Kiki Co., Ltd. Variable delivery compressor. 4,505,122, Cl. 62-133.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,506,133, Cl. 219-69.00C.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Dynamic balancing machine using EDM. 4,506,133, Cl. 219-69.00C.
Inoue, Tokuta: *See*—
Kanda, Mutsumi; Matsushita, Souichi; Nakanishi, Kiyoshi; and Inoue, Tokuta, 4,505,233, Cl. 123-41.350.
Institut Francais du Petrole: *See*—
Deschamps, Andre ; Cosyns, Jean; Le Page, Jean-Francois; and Hotier, Gerard, 4,505,880, Cl. 423-219.000.
Layotte, Pierre-Claude; Dubois, Jean-Claude; and James, Andre , 4,505,362, Cl. 188-67.000.
Intel Corporation: *See*—
Bohr, Mark T.; Yu, Ken K.; Yau, Leo D.; and Garg, Shyam G., 4,505,026, Cl. 29-577.00C.
Intercontrole Societe Anonyme: *See*—
de la Pintiere, Louis; and Ballereau, Jean, 4,505,323, Cl. 165-11.00A.
Interlake, Inc.: *See*—
Gruen, Alfred J., 4,505,415, Cl. 227-88.000.
Intermedicat GmbH: *See*—
Braun, Karl; and Fetzer, Jurgen, 4,505,273, Cl. 128-335.000.
International Business Machines Corporation: *See*—
Aichelmann, Frederick J., Jr.; and Lange, Lawrence K., 4,506,364, Cl. 371-38.000.
Cadwallader, Robert H.; Edmonds, Harold D.; and Kulkarni, Murlidhar V., 4,506,158, Cl. 250-338.000.
Cardero, Silvio A., 4,506,305, Cl. 360-46.000.
Coughlin, Charles P., 4,506,215, Cl. 324-158.00P.
Kalter, Howard L.; and Wiedman, Francis W., 4,506,341, Cl. 364-786.000.
Scheuerlein, Roy E.; and Ogura, Seiki, 4,506,351, Cl. 365-205.000.
Shaw, Philip S.; Sordi, Joseph J.; and Traiger, Irving L., 4,506,326, Cl. 364-300.000.
Shipp, Kenneth O., Jr.; Wood, Richard B.; and Repass, James T., 4,506,343, Cl. 364-900.000.
International Flavors & Fragrances, Inc.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,506,104, Cl. 568-820.000.
International Paint: *See*—
Baxter, Kenneth F., 4,505,748, Cl. 106-14.390.
International Paper Company: *See*—
Balanovsky, Lev; and Brauner, Arne H., 4,505,423, Cl. 229-5.500.
International Standard Electric Corporation: *See*—
Bloch, Samuel; Bressler, Klaus; Idler, Horst; and Kleiber, Herbert, 4,506,332, Cl. 364-483.000.
Blomley, Peter F., 4,506,113, Cl. 179-81.00B.
Prohaska, Peter, 4,505,552, Cl. 350-392.000.
Tischer, Kurt M.; Voigt, Klaus-Peter; and Zondler, Rolf, 4,505,685, Cl. 445-24.000.
Vance, Ian A. W.; Jeffrey, Colin; Bidwell, Brian A.; Leevers, David F. A.; and Woodley, Michael J. A., 4,506,262, Cl. 340-825.440.
International Telephone and Telegraph Corporation: *See*—
Bogert, Warren D.; Kiss, Marvin L.; and Yee, Gin W., 4,506,264, Cl. 343-18.00E.
Interpace Corporation: *See*—
Wheeler, Edward S., 4,505,033, Cl. 29-631.000.
Invernizzi, Renzo; and Ligorati, Ferdinando, to Enichimica Secondaria S.p.A. Method of preparing a supported Ziegler-catalyst for the polymerization of alpha-olefins. 4,506,027, Cl. 502-9.000.
Ionics, Incorporated: *See*—
Hodgdon, Russell B.; and Waite, Warren A., 4,505,797, Cl. 204-252.000.
Ishida, Hideaki: *See*—
Takenouchi, Hiroo; Ishida, Hideaki; and Hiyama, Kunio, 4,506,111, Cl. 179-2.00A.
Ishige, Yoshiki: *See*—
Ariga, Yoshio; Ishige, Yoshiki; Satoh, Shogi; Tegawa, Masao; Kinugasa, Toshiyuki; and Yamamoto, Toru, 4,505,774, Cl. 156-499.000.
Ishiguro, Minoru: *See*—
Asano, Seiji; Kagechika, Takashi; and Ishiguro, Minoru, 4,505,568, Cl. 354-458.000.
Ishihara, Toshiro: *See*—
Kobayashi, Hisamine; and Ishihara, Toshiro, 4,505,072, Cl. 51-164.200.
Ishii, Taiji; and Tarutani, Takashi, to Dai Nippon Insatsu Kabushiki Kaisha. Resinous flooring sheet. 4,505,968, Cl. 428-172.000.
Ishikawa, Jiro: *See*—
Kaneko, Yasuyuki; Ito, Masao; Ogura, Yukio; and Ishikawa, Jiro, 4,505,821, Cl. 210-611.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Yoshimatsu, Yoshiaki, 4,506,370, Cl. 373-8.000.
Ishiko, Hideo: *See*—
Kusakabe, Hiroyoshi; Ishiko, Hideo; Okumura, Takeshi; Izumi, Masashi; and Furukawa, Masahiro, 4,505,123, Cl. 62-148.000.
Isogai, Sakichi; Mizuhata, Teruo; Takahashi, Masaaki; Imai, Takayoshi; Nakanishi, Kazuyoshi; Ito, Takefumi; and Koshihara, Atsuo, to Takenaka Komuten Co., Ltd. Apparatus for hoisting materials and placing concrete. 4,505,397, Cl. 212-232.000.
Isoya, Yukinori: *See*—
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Isuzu Motors Ltd.: *See*—
Kawamura, Hideo; Otsubo, Isamu; and Kitagawa, Tsutomu, 4,506,145, Cl. 219-499.000.
Itek Corporation: *See*—
Hannan, William J., 4,506,303, Cl. 358-302.000.
Ito, Haruo: *See*—
Ito, Hideaki; and Ito, Haruo, 4,505,942, Cl. 426-551.000.
Ito, Hideaki; and Ito, Haruo. Manufacture of snack foods. 4,505,942, Cl. 426-551.000.
Ito, Kazuyuki: *See*—
Akamine, Kazuhiko; Ebara, Katsuya; Ito, Kazuyuki; and Mitani, Shinji, 4,505,824, Cl. 210-695.000.
Ito, Kenichi: *See*—
Kato, Kiichi; Musha, Tohru; and Ito, Kenichi, 4,505,584, Cl. 356-123.000.
Ito, Masao: *See*—
Kaneko, Yasuyuki; Ito, Masao; Ogura, Yukio; and Ishikawa, Jiro, 4,505,821, Cl. 210-611.000.
Ito, Takefumi: *See*—
Isogai, Sakichi; Mizuhata, Teruo; Takahashi, Masaaki; Imai, Takayoshi; Nakanishi, Kazuyoshi; Ito, Takefumi; and Koshihara, Atsuo, 4,505,397, Cl. 212-232.000.
Ito, Takehiko: *See*—
Itoh, Masahiko; Midorikawa, Heihatiro; Minato, Akira; Kubo, Mituru; Ito, Takehiko; and Katayama, Kiichiro, 4,505,760, Cl. 148-6.15R.
Ito, Tatsuo: *See*—
Mizuno, Masataka; Ito, Tatsuo; Sugawara, Shuji; Moriyama, Masakazu; Muto, Masahito; and Nakane, Shuji, 4,506,266, Cl. 343-715.000.
Ito, Toshio, to Nichiban Co., Ltd.; Nippon Kayaku Kabushiki Kaisha; and Taiho Pharmaceutical Company, Limited. Medicinal adhesive sheets for heart diseases and a process for the preparation thereof. 4,505,891, Cl. 424-28.000.
Ito, Yasuyuki: *See*—
Sugawara, Toru; and Ito, Yasuyuki, 4,506,160, Cl. 250-427.000.
Ito, Yo: *See*—
Hamada, Takao; Tsuchiya, Nobuo; Ito, Yo; Inatani, Toshihiro; Takada, Yoshiyasu; Sumito, Mitsuo; Koitabashi, Toshimitsu; and Katayama, Hideshi, 4,505,745, Cl. 75-129.000.
Itoh, Isamu: *See*—
Nakajima, Junya; Itoh, Isamu; Yamamuro, Kiyohiko; and Ogawa, Eiiti, 4,506,007, Cl. 430-393.000.
Itoh, Masahiko; Midorikawa, Heihatiro; Minato, Akira; Kubo, Mituru; Ito, Takehiko; and Katayama, Kiichiro, to Hitachi, Ltd.; and Nisshin Steel Co., Ltd. Process for partial hot dipping of steel strips. 4,505,760, Cl. 148-6.15R.
ITT Corporation: *See*—
Sawyer, Edgar W., Jr., 4,505,716, Cl. 44-51.000.
ITT Industries, Inc.: *See*—
Burgdorf, Jochen; and Budecker, Ludwig, 4,505,652, Cl. 417-462.000.
Elmis, Herbert, 4,506,297, Cl. 358-153.000.
Haar, Lucas H., 4,505,114, Cl. 60-554.000.
Reinartz, Hans-Dieter; and Vatter, Waldemar, 4,505,113, Cl. 60-535.000.
Weiler, Rolf; and Bohm, Peter, 4,505,116, Cl. 60-562.000.
Ivanova, Tatyana L.: *See*—
Utyamyshev, Rustam I.; Smirnov, Boris A.; Kanshin, Nikolai N.; Korolkov, Ivan A.; and Ivanova, Tatyana L., 4,505,272, Cl. 128-305.000.
Iwahashi, Hiroshi: *See*—
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Okada, Yukio; and Iwamura, Akira, 4,505,457, Cl. 267-3.000.
Iwasaki, Masayuki: *See*—
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Iwata, Seiichi: *See—*
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Izumi, Masashi: *See—*
Kusakabe, Hiroyoshi; Ishiko, Hideo; Okumura, Takeshi; Izumi, Masashi; and Furukawa, Masahiro, 4,505,123, Cl. 62-148.000.

J. Hengstler K.G.: *See—*
Kratt, Kurt, 4,506,373, Cl. 377-88.000.

J. M. Voith, GmbH: *See—*
Osswald, Manfred; Rau, Hanns; and Fissmann, Hans-Joachim, 4,505,052, Cl. 34-114.000.

J. P. Howes Productions: *See—*
Howes, James P.; and Richardson, James E., 4,505,132, Cl. 62-457.000.

Jaakola, Kenneth A.: *See—*
Bennett, James W.; Howe, Gary L.; Jaakola, Kenneth A.; and Koutavas, Samuel G., 4,506,138, Cl. 219-205.000.

Jabagchourian, Hrair; and Lucas, Louis, Jr., to Kilovac Corporation. High voltage relay. 4,506,244, Cl. 335-151.000.

Jack, Kenneth H.; and Trigg, Mark B., to Lucas Cookson Syalon Limited. 0'-Phase sialon ceramic product and a method of forming dense ceramic product. 4,506,021, Cl. 501-98.000.

Jackson, John, to University of Strathclyde. Electrically-conductive materials. 4,505,847, Cl. 252-511.000.

Jackson, Joshua M., to Sperry-Sun, Inc. Borehole pressure measuring system. 4,505,155, Cl. 73-151.000.

Jacob, Adir; and Choe, Daniel H., to LFE Corporation. Plasma reactive ion etching of aluminum and aluminum alloys. 4,505,782, Cl. 156-643.000.

Jacobs, Geoffrey P.: *See—*
El-On, Joseph; and Jacobs, Geoffrey P., 4,505,901, Cl. 514-38.000.

Jacobs, John H., to Transamerica Delaval Inc. Illumination and light gate utilization methods and apparatus. 4,505,551, Cl. 350-384.000.

Jacobs, Stephan J., to Power-Train, Inc. Through-shaft energy converter transmission. 4,505,185, Cl. 91-491.000.

Jacoby, George V.; and Cohn, Martin, to Sperry Corporation. Ternary data encoding system. 4,506,252, Cl. 340-347.0DD.

Jacquinot, Bernard: *See—*
Lhonore, Pierre; Quibel, Jacques; Jacquinot, Bernard; Jestin, Yvon; and Pelletier, Robert, 4,505,879, Cl. 422-197.000.

Jaeger, Kurt S.: *See—*
Martin, Richard R.; and Jaeger, Kurt S., 4,505,666, Cl. 431-175.000.

Jaeger, Thomas S., to Honeywell Inc. Control valve apparatus. 4,505,300, Cl. 137-614.140.

Jager, Gerhard; Buchel, Karl H.; Kramer, Wolfgang; Frohberger, Paul-Ernst; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Triazolealkynol fungicidal agents. 4,505,922, Cl. 514-383.000.

Jain, Nemichand B.; and Patel, Mahendra R., to E. R. Squibb & Sons, Inc. Controlled release formulation and method. 4,505,890, Cl. 424-21.000.

James, Andre : *See—*
Layotte, Pierre-Claude; Dubois, Jean-Claude; and James, Andre , 4,505,362, Cl. 188-67.000.

James River-Norwalk, Inc.: *See—*
Kuchenbecker, Morris W., 4,505,391, Cl. 206-622.000.

Japan Synthetic Rubber Co., Ltd.: *See—*
Makino, Kenya; Sakurai, Hideo; Toyoda, Toshiyuki; and Matsuo, Yoshitaka, 4,506,061, Cl. 526-142.000.

Jeffery, John: *See—*
Wheeldon, John B.; Jeffery, John; and Myerscough, Paul F., 4,505,383, Cl. 198-853.000.

Jeffrey, Colin: *See—*
Vance, Ian A. W.; Jeffrey, Colin; Bidwell, Brian A.; Leevers, David F. A.; and Woodley, Michael J. A., 4,506,262, Cl. 340-825.440.

Jelks, Edward C., to Texas Instruments Incorporated. Thin film deposition using plasma-generated source gas. 4,505,949, Cl. 427-38.000.

Jestin, Yvon: *See—*
Lhonore, Pierre; Quibel, Jacques; Jacquinot, Bernard; Jestin, Yvon; and Pelletier, Robert, 4,505,879, Cl. 422-197.000.

Jet Research Center, Inc.: *See—*
Regalbuto, John A.; Christopher, Glenn B.; and Motley, Jerry D., 4,505,018, Cl. 29-432.000.

Jetter, Hans, to Bizerba-Werke Wilhelm Kraut GmbH & Co. KG. Force measuring device. 4,505,345, Cl. 177-211.000.

Jeuch, Pierre, to Commissariat a l'Energie Atomique. Process for positioning an interconnection line on an electrical contact hole of an integrated circuit. 4,505,030, Cl. 29-591.000.

Jeumont-Schneider: *See—*
Delloye, N., 4,505,872, Cl. 376-203.000.

Jidosha Kiki Co., Ltd.: *See—*
Masuda, Kosaku; and Tashiro, Shuichirow, 4,505,649, Cl. 417-300.000.

Joannou, Kyriacos; and Coots, William P., to Pericomp Corporation. Tape drive calibration meter. 4,506,309, Cl. 360-137.000.

Jodon Engineering Associates, Inc.: *See—*
Haddox, Mark L., 4,505,152, Cl. 73-117.200.

Joensen, Jon O., to Matcon Radgivende Ingeni rfirma ApS. Process for shucking and eviscerating scallops. 4,505,004, Cl. 17-48.000.

Johansson, Uno: *See—*
Bergstrom, Hans R.; and Johansson, Uno, 4,505,145, Cl. 72-457.000.

John Wyeth & Brother Limited: *See—*
Crossley, Roger, 4,506,082, Cl. 548-533.000.

John Zink Company: *See—*
Martin, Richard R.; and Jaeger, Kurt S., 4,505,666, Cl. 431-175.000.

Johnson, Craig B.: *See—*
Pusic, Vladi; George, Benjamin T.; Smith, Monte E.; and Johnson, Craig B., 4,506,323, Cl. 364-200.000.

Johnson, David A. Sling swivel. 4,505,012, Cl. 24-643.000.

Johnson, Glyn: *See—*
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,506,222, Cl. 324-309.000.

Johnson & Johnson Products, Inc.: *See—*
Doehnert, Donald F.; and Hill, Arthur S., 4,505,976, Cl. 428-355.000.

Johnson, Reginald F., to Baker Perkins Holdings PLC. Apparatus for collating articles to be wrapped into batches. 4,505,093, Cl. 53-531.000.

Johnson, Timothy L., to Francis Tool Company. Volumetric measure for granular material. 4,505,407, Cl. 222-181.000.

Johnston, Calvin M. Apparatus for applying and working a cleansing preparation on contact lenses. 4,504,994, Cl. 15-104.920.

Jonas, Rolf, to Kim Production Limited. Diaphragm valve. 4,505,451, Cl. 251-285.000.

Jones, Donald W.; and Miller, Timothy J. E., to General Electric Company. Permanent magnet rotor with complete amortisseur. 4,506,181, Cl. 310-156.000.

Jones, Frank: *See—*
Seddon, James; and Jones, Frank, 4,505,517, Cl. 299-31.000.

Jones, Gary V.; Meinhold, James F.; and Musto, Joseph A., to General Foods Corporation. Non-caffeine solids recovery process. 4,505,940, Cl. 426-424.000.

Jones, Howard: *See—*
Loev, Bernard; Jones, Howard; and Suh, John T., 4,505,920, Cl. 514-341.000.
Loev, Bernard; Chan, Wan-Kit; and Jones, Howard, 4,505,930, Cl. 514-529.000.

Jones, Jesse D.: *See—*
Mueller, Warren B.; and Jones, Jesse D., 4,506,049, Cl. 524-139.000.

Jones, Kent R. Ski training aid. 4,505,681, Cl. 434-253.000.

Jones, Richard A., to Board of Regents, University of Texas System, The. Catalysts for hydrogenation of aromatic compounds. 4,506,030, Cl. 502-155.000.

Jones, Robert; and Thompson, Hubert R., to Certified Grocers of Florida, Inc. Food product transport system. 4,505,126, Cl. 62-239.000.

Jordan, Friedrich, to Klockner-Humboldt-Deutz Aktiengesellschaft. Gastight, undetachable connection of two metal parts. 4,505,238, Cl. 123-193.0CH.

Julius Blum Gesellschaft m.b.H.: *See—*
Rock, Erich; and Hollenstein, Helmut, 4,505,610, Cl. 403-231.000.

Jumel, Bernard: *See—*
Herbulot, Jean; and Jumel, Bernard, 4,505,363, Cl. 188-72.500.

Jung, Helmut; Pempera, Franz G.; and Riedesel, Udo, to Mannesmann Aktiengesellschaft. Drying apparatus for metallic belt processed in a fluid. 4,505,050, Cl. 34-54.000.

Jungverdorben, Hermann-Josef: *See—*
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Uhlemann, Hans, 4,505,870, Cl. 264-206.000.

kabelmetal electro Gesellschaft mit beschrankter Haftung: *See—*
Ziemek, Gerhard; Schatz, Friedrich; Muller, Dieter; and Rowell, Douglas W., 4,506,135, Cl. 219-107.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Komatsu, Kazuyuki, 4,506,273, Cl. 346-76.0PH.
Nonaka, Kei, 4,505,599, Cl. 374-163.000.

Kabushiki Kaisha Hirai Tekkosho: *See—*
Hirai, Seiji, 4,505,463, Cl. 269-56.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Fukutsuka, Toshiro; Moritoki, Masato; Fujikawa, Takao; and Gennai, Norio, 4,505,762, Cl. 148-11.50R.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Deguchi, Hideaki, 4,505,172, Cl. 83-74.000.

Kabushiki Kaisha Morita Seisakusho: *See—*
Nakayama, Shozo; and Watanabe, Hiroo, 4,505,677, Cl. 433-132.000.

Kabushiki Kaisha Sato: *See—*
Sato, Yo; Kashiwaba, Tadao; Matsuda, Yasuhiko; and Oikawa, Tadahisa, 4,505,773, Cl. 156-384.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Kurushima, Tadanori; Hidaka, Hideo; and Sonoda, Hiroyoshi, 4,505,101, Cl. 57-301.000.
Shinoda, Akibumi; Yoshioka, Yukio; and Kato, Akio, 4,505,635, Cl. 414-667.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Kuno, Toshitaka; and Ikeda, Toshiaki, 4,505,049, Cl. 33-333.000.

Kagechika, Takashi: *See—*
Asano, Seiji; Kagechika, Takashi; and Ishiguro, Minoru, 4,505,568, Cl. 354-458.000.

Kaiser, Alfred: *See—*
Schmidt, Helmut; Kaiser, Alfred; and Scholze, Horst, 4,505,985, Cl. 428-447.000.

Kaji, Hisatsugu: *See—*
Fukuda, Hiroyuki; Kaji, Hisatsugu; Fujimaki, Hiroto; Yamanobe, Yoichiro; Hiruta, Masaru; and Ohmi, Sigeru, 4,506,028, Cl. 502-101.000.

Kaken Pharmaceutical Co. Ltd.: *See—*
Kojima, Takemasa; Tabata, Kengo; Yanaki, Toshio; and Mitani, Mitsuaki, 4,505,757, Cl. 127-36.000.

Kakimoto, Atsushi; Takita, Masaaki; and Watanabe, Shinichi, to Matsushita Electric Industrial Co., Ltd. Paper feeding apparatus. 4,505,469, Cl. 271-91.000.

Kakimoto, Toshihiko, to Nissan Motor Company, Limited. Fluid-filled engine mount device. 4,505,461, Cl. 267-140.100.

Kakizoe, Masahiro: *See*—
Okado, Hiroyuki; Kakizoe, Masahiro; Otsuka, Shigeharu; and Sako, Yuji, 4,506,243, Cl. 335-132.000.

Kali-Chemie Pharma GmbH: *See*—
Zeugner, Horst; Ruhland, Michael; Liepmann, Hans; Milkowski, Wolfgang; and Muesch, Herbert, 4,505,908, Cl. 514-221.000.

Kaltenthaler, Wolfgang: *See*—
Heger, Werner; Kaltenthaler, Wolfgang; and Wilke, Helmut, 4,505,648, Cl. 417-297.000.

Kalter, Howard L.; and Wiedman, Francia W., to International Business Machines Corporation. Interlaced programmable logic array having shared elements. 4,506,341, Cl. 364-786.000.

Kameswaran, Venkataraman, to American Cyanamid Co. Method for the racemization of (2)-2-(4-difluoromethoxyphenyl)-3-methylbutyric acid. 4,506,097, Cl. 562-401.000.

Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, to Fujisawa Pharmaceutical Co., Ltd. Amino or amidothiazolyl, substituted oxyimino disubstituted acetic acid. 4,506,076, Cl. 548-119.000.

Kammel, Roland: *See*—
Lieber, Hans-Wilhelm; and Kammel, Roland, 4,505,958, Cl. 427-433.000.

Kammeyer, Karl-Dirk, to Robert Bosch GmbH. Digital FM detector. 4,506,228, Cl. 329-107.000.

Kanamaru, Hisanobu: *See*—
Shizuka, Masayuki; Ogasawara, Nobuhiko; Kanamaru, Hisanobu; and Tsuruoka, Kazuhiro, 4,506,180, Cl. 310-91.000.

Kanda, Mutsumi; Matsushita, Souichi; Nakanishi, Kiyoshi; and Inoue, Tokuta, to Toyota Jidosha Kabushiki Kaisha. Piston assembly with cooling lubricant reservoir defining member with a deep narrow reservoir and a shallow wide reservoir. 4,505,233, Cl. 123-41.350.

Kandler, Joachim: *See*—
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, 4,505,849, Cl. 252-609.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Furukawa, Hisao; and Kato, Yasushi, 4,506,052, Cl. 524-357.000.

Kanekiyo, Kazue; Kobayashi, Masatsune; Yokoyama, Yasumasa; Eida, Tsuyoshi; Komori, Tomoko; and Koike, Shoji, to Canon Kabushiki Kaisha. Method of forming color images. 4,505,749, Cl. 106-20.000.

Kaneko, Toshio: *See*—
Miwa, Hiroshi; Kaneko, Toshio; Tonouchi, Akira; and Anan, Tatsuro, 4,505,785, Cl. 204-28.000.

Kaneko, Toshiro. Hydroponic method and apparatus for cultivating vegetables and other plants. 4,505,068, Cl. 47-59.000.

Kaneko, Yasuyuki; Ito, Masao; Ogura, Yukio; and Ishikawa, Jiro, to Nagoya University. Method of treating waste liquors containing phenolics and formaldehyde. 4,505,821, Cl. 210-611.000.

Kanshin, Nikolai N.: *See*—
Utyamyshev, Rustam I.; Smirnov, Boris A.; Kanshin, Nikolai N.; Korolkov, Ivan A.; and Ivanova, Tatyana L., 4,505,272, Cl. 128-305.000.

Karlsson, Ingemar: *See*—
Andersson, Karl-Hugo; Karlsson, Ingemar; and Quick, Rolf, 4,505,053, Cl. 34-155.000.

Karpe, Wolfgang; Kluge, Johannes; and Hasselmann, Heinz, to Mannesmann Aktiengesellschaft. Twin-circuit breaker. 4,506,242, Cl. 335-120.000.

Kasai Kogyo Co., Ltd.: *See*—
Nagashima, Tsuneyasu; and Sato, Youji, 4,505,611, Cl. 403-406.000.

Kasai, Shozo: *See*—
Nishizawa, Hiroshi; Mukoyama, Yoshiyuki; Kasai, Shozo; and Okada, Yasunori, 4,505,980, Cl. 428-383.000.

Kaschner, William C.; and Bobolts, Elroy, Jr., to Besser Company. Article transfer apparatus. 4,505,630, Cl. 414-152.000.

Kashigi, Kazuo, to Nippon Electric Co., Ltd. PAL digital video signal processing arrangement. 4,506,286, Cl. 358-13.000.

Kashiwaba, Tadao: *See*—
Sato, Yo; Kashiwaba, Tadao; Matsuda, Yasuhiko; and Oikawa, Tadahisa, 4,505,773, Cl. 156-384.000.

Kashiwada, Yasutoshi: *See*—
Chinone, Naoki; Kashiwada, Yasutoshi; Yamashita, Shigeo; and Aiki, Kunio, 4,506,366, Cl. 372-45.000.

Katagi, Takashi; Makino, Shigeru; Tanaka, Hirokazu; and Kobayashi, Yuji, to Mitsubishi Denki Kabushiki Kaisha. Reflecting mirror antenna unit with diverse curvature. 4,506,270, Cl. 343-914.000.

Katayama, Hideshi: *See*—
Hamada, Takao; Tsuchiya, Nobuo; Ito, Yo; Inatani, Toshihiro; Takada, Yoshiyasu; Sumito, Mitsuo; Koitabashi, Toshimitsu; and Katayama, Hideshi, 4,505,745, Cl. 75-129.000.

Katayama, Kiichiro: *See*—
Itoh, Masahiko; Midorikawa, Heihatiro; Minato, Akira; Kubo, Mituru; Ito, Takehiko; and Katayama, Kiichiro, 4,505,760, Cl. 148-6.15R.

Kato, Akio: *See*—
Shinoda, Akibumi; Yoshioka, Yukio; and Kato, Akio, 4,505,635, Cl. 414-667.000.

Kato, Kiichi; Musha, Tohru; and Ito, Kenichi, to Olympus Optical Co., Ltd. Method and apparatus for detecting focussing error signal of objective lens. 4,505,584, Cl. 356-123.000.

Kato, Kiichi: *See*—
Yoshikawa, Shoji; Ohshima, Ken; Kodama, Hiroshi; Yamamiya, Kunio; Sakamoto, Masaharu; and Kato, Kiichi, 4,505,585, Cl. 356-237.000.

Kato, Yasushi: *See*—
Furukawa, Hisao; and Kato, Yasushi, 4,506,052, Cl. 524-357.000.

Katsube, Hideo; Gamo, Gotaro; Kinoshita, Mitsuo; and Nomura, Yoshiyuki, to Fujitsu Fanuc Limited. Apparatus for processing a broken wire electrode used during electro-discharge machining. 4,506,129, Cl. 219-69.00W.

Katsuyama, Toshio: *See*—
Matsumura, Hiroyoshi; Katsuyama, Toshio; and Suganuma, Tsuneo, 4,505,729, Cl. 65-3.110.

Katzman, Abe. Multi-colored wrapper label with readable data on both sides. 4,505,497, Cl. 283-81.000.

Kaufeldt, Roland, to Monark-Crescent AB. Method and a device for automatically mounting spokes in wheels. 4,505,315, Cl. 157-1.500.

Kaufhold, Manfred; and Takken, Hendrik J., to Chemische Werke Huls AG; and Naarden International N.V. 2-Methoxyethyl cyclododecenyl ether and processes for its preparation and conversion to 2-methoxyethyl cyclododecyl ether. 4,506,102, Cl. 568-667.000.

Kaufhold, Manfred, to Chemische Werke Huls AG. Process for preparing cyclooctene-4-ol-1 from cyclooctadiene-1,5. 4,506,105, Cl. 568-821.000.

Kaufmann, Herbert; and Larsson, Jan, to ASEA Aktiebolag. Contact device for heavy electrical currents. 4,506,123, Cl. 200-83.00J.

Kawaguchi, Katsukiyo: *See*—
Suzuki, Michihiko; Kawaguchi, Katsukiyo; and Kojima, Yoshihiko, 4,505,946, Cl. 427-29.000.

Kawahara, Atsushi: *See*—
Hada, Kazunari; Fujii, Norio; Kawahara, Atsushi; Azuma, Toru; and Hazama, Junji, 4,506,382, Cl. 382-27.000.

Kawahara, Hisashi; Kihara, Hiroyuki; and Sase, Masahiro, to Citizen Watch Co. Ltd. Multi-function analogue type watch. 4,505,594, Cl. 368-73.000.

Kawakami, Shigenobu: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,506,107, Cl. 174-25.00C.

Kawamata, Motoo: *See*—
Tsuboi, Hikotada; Kawamata, Motoo; Oba, Masayuki; and Koga, Nobuhito, 4,506,042, Cl. 523-454.000.

Kawamura, Fumio: *See*—
Funabashi, Kiyomi; Kawamura, Fumio; Kikuchi, Makoto; and Yusa, Hideo, 4,505,851, Cl. 252-628.000.

Kawamura, Hideo; Otsubo, Isamu; and Kitagawa, Tsutomu, to Isuzu Motors Ltd. Device for controlling engine preheating. 4,506,145, Cl. 219-499.000.

Kawamura, Hironobu, to Kawamura Shouji Kabushiki Kaisha. Necktie assembly. 4,504,979, Cl. 2-153.000.

Kawamura Shouji Kabushiki Kaisha: *See*—
Kawamura, Hironobu, 4,504,979, Cl. 2-153.000.

Kawanishi, Hidekata: *See*—
Naruo, Noboru; and Kawanishi, Hidekata, 4,506,251, Cl. 338-238.000.

Kawano, Akihiro: *See*—
Terauchi, Kiyoshi; Kawano, Akihiro; and Mabe, Atsushi, 4,505,651, Cl. 417-440.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Okada, Yukio; and Iwamura, Akira, 4,505,457, Cl. 267-3.000.

Kawasaki Steel Corporation: *See*—
Hamada, Takao; Tsuchiya, Nobuo; Ito, Yo; Inatani, Toshihiro; Takada, Yoshiyasu; Sumito, Mitsuo; Koitabashi, Toshimitsu; and Katayama, Hideshi, 4,505,745, Cl. 75-129.000.

Kawashima, Takao, to Pioneer Electronic Corporation. Tape cassette. 4,505,440, Cl. 242-199.000.

Kawata, Toshikatsu: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikazu; Kawata, Toshikatsu; Kiboshi, Shinzi; and Shibata, Akiyoshi, 4,506,053, Cl. 524-405.000.

Kawate, Keiichi; and Sekiya, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing semiconductor device, including a step of patterning a conductor layer. 4,505,024, Cl. 29-571.000.

Kay, Ian T.; and Noon, Robert A., to Imperial Chemical Industries PLC. Aminonitrile intermediates. 4,506,084, Cl. 549-74.000.

Keeney, Bill H. Perspective drawing templates. 4,505,041, Cl. 33-1.00K.

Keeve, Rolf: *See*—
Gottzein, Eveline; Keeve, Rolf; and Surauer, Michael, 4,505,206, Cl. 104-284.000.

Keil, Rudolf: *See*—
Auracher, Franz; Buerk, Hermann; Keil, Rudolf; Stockmann, Michael; Weingand, Kaspar; and Zeitler, Karl-Heinz, 4,505,539, Cl. 350-96.150.

Keiper Automobiltechnik GmbH & Co. KG: *See*—
Wilking, Hans; Heinrich, Kurt; and Peetz, Walter, 4,505,515, Cl. 297-362.000.

Keller, Manfred, to Kernforschungsanlage Julich GmbH. Thermoluminescence dosimeter taking account of tissue depth of dose. 4,506,157, Cl. 250-337.000.

Keller, Wolfgang, to Siemens Katiengesellschaft. Induction coil in the form of a flat coil for crucible-free floating zone melting. 4,506,132, Cl. 219-10.790.

Kelly, John W., to Haskel, Inc. Flexible high pressure conduit and hydraulic tool for swaging. 4,505,142, Cl. 72-54.000.

Kelly, Kenneth W., Jr. Clamping tool. 4,505,624, Cl. 408-109.000.

Kelly, Lawrence S.; Schaffran, Dean L.; and Nii, Donald S., to Graco Inc. Proportional pumping system. 4,505,405, Cl. 222-135.000.

Kemnetz, Steven J.: *See*—
Cody, Charles A.; Reichert, William W.; Kemnetz, Steven J.; and Magauran, Edward D., 4,505,886, Cl. 423-616.000.

Kemper, Winfried: *See*—
Eichmanns, Herbert; Meyer, Wilhelm; and Kemper, Winfried, 4,505,713, Cl. 8-483.000.

Kendale Industries, Inc.: *See*—
Krall, Donald J., 4,505,524, Cl. 384-615.000.

Kenmochi, Hirohito: *See*—
Shimidzu, Yasutaka; Kenmochi, Hirohito; Ueno, Toshihiko; and Tani, Chizuka, 4,505,549, Cl. 350-349.000.

Kennedy, Dan J.: *See*—
White, James T., Sr.; and Kennedy, Dan J., 4,506,060, Cl. 525-163.000.

Kennedy, Leo J., to Owens-Illinois, Inc. Method for making a polyvinylidene chloride coated biaxially oriented polyethylene terephthalate container. 4,505,951, Cl. 427-55.000.

Kernforschungsanlage Julich GmbH: *See*—
Keller, Manfred, 4,506,157, Cl. 250-337.000.
Wolters, Johannes; David, Paul-Johannes; and Heller, Monika, 4,505,875, Cl. 376-283.000.

Kersch, Dennis R.; and Mitchell, Don E., to Sperry Corporation. Copper body power hybrid package and method of manufacture. 4,506,108, Cl. 174-52.0FP.

Kesselring, Lutz, to MAPA GmbH Gummi- und Plastikwerke. Teat. 4,505,398, Cl. 215-11.00B.

Keter Plastic (USA) Inc.: *See*—
Sagol, Sami, 4,505,408, Cl. 222-185.000.

Keystone International, Inc.: *See*—
Scobie, William B., 4,505,290, Cl. 137-74.000.

Khismatulin, Enver R.: *See*—
Makarov, Viktor M.; Paton, Boris E.; Globin, Nikolai K.; Usenko, Viktor G.; Khismatulin, Enver R.; Ziselman, Boris G.; Serov, Petr G.; Shel, Marat M.; and Rozenberg, Ovshiya O., 4,505,417, Cl. 228-17.700.

Kiboshi, Shinzi: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikazu; Kawata, Toshikatsu; Kiboshi, Shinzi; and Shibata, Akiyoshi, 4,506,053, Cl. 524-405.000.

Kida, Masahiko: *See*—
Nakayashiki, Susumu; Kida, Masahiko; and Hashimoto, Toyokazu, 4,506,357, Cl. 370-16.000.

Kiester, Phillip D. Ski boot sole extension. 4,505,057, Cl. 36-117.000.

Kihara, Hiroyuki: *See*—
Kawahara, Hisashi; Kihara, Hiroyuki; and Sase, Masahiro, 4,505,594, Cl. 368-73.000.

Kijima, Naoto: *See*—
Oguri, Yasuo; Saito, Junji; and Kijima, Naoto, 4,505,866, Cl. 264-42.000.

Kikkoman Corporation: *See*—
Togawa, Hideo; Takezawa, Taihei; Watanabe, Masazumi; Hayashi, Kazuya; and Okuhara, Akira, 4,505,938, Cl. 426-46.000.

Kikuchi, Makoto: *See*—
Funabashi, Kiyomi; Kawamura, Fumio; Kikuchi, Makoto; and Yusa, Hideo, 4,505,851, Cl. 252-628.000.

Killian, George W.: *See*—
Mande, Irving; Right, Robert W.; and Killian, George W., 4,506,253, Cl. 340-506.000.

Killinger, Karl H., to Singer Company, The. Stitch length control for hand operable sewing machine. 4,505,213, Cl. 112-315.000.

Kilovac Corporation: *See*—
Jabagchourian, Hrair; and Lucas, Louis, Jr., 4,506,244, Cl. 335-151.000.

Kilpela, Tauno B., to Michigan Technological University, Board of Control of. Flake feeder aligner including reciprocating baffles. 4,505,663, Cl. 425-363.000.

Kim, Dong H.: *See*—
McCaully, Ronald J.; and Kim, Dong H., 4,506,077, Cl. 548-402.000.

Kim Production Limited: *See*—
Jonas, Rolf, 4,505,451, Cl. 251-285.000.

Kimberly-Clark Corporation: *See*—
Matthews, Billie J.; and Bornslaeger, S. Richard, 4,505,705, Cl. 604-385.000.
Roeder, Robert J., 4,505,704, Cl. 604-385.000.

Kimura, Hiroshi; Hisajima, Masahiko; and Shigemura, Yutaka, to Mita Industrial Co. Ltd. Copy paper supply system for a transfer type electrostatic copying apparatus. 4,505,571, Cl. 355-3.0SH.

Kimura, Tetsuo: *See*—
Suzuki, Takashi; Kimura, Tetsuo; and Tanaka, Seiichi, 4,505,600, Cl. 374-170.000.

Kimura, Tomoaki, to Hitachi, Ltd. Continuous sheet metal casting device. 4,505,319, Cl. 164-432.000.

King, Mary K.; White, Roger N.; and Gregory, Paul E., Jr. Disposable zoned surgical gown. 4,504,977, Cl. 2-51.000.

King, Roger: *See*—
Miller, Donald S.; and King, Roger, 4,505,617, Cl. 405-211.000.

Kingsbury, Charles M.: *See*—
Morris, Nicholas G.; Kingsbury, Charles M.; and Beckwith, Bruce R., 4,505,731, Cl. 65-225.000.

Kingsley, William; Stoffel, James C.; Moreland, John F., Jr.; Matteson, Ronald G.; Wiggins, Douglas G.; and Allis, Robert F., to Xerox Corporation. Multiple mode raster scanner. 4,506,301, Cl. 358-280.000.

Kinoshita, Mikio, to Okuma Machinery Works Ltd. Tool replacing device. 4,505,020, Cl. 29-568.000.

Kinoshita, Mitsuo: *See*—
Katsube, Hideo; Gamo, Gotaro; Kinoshita, Mitsuo; and Nomura, Yoshiyuki, 4,506,129, Cl. 219-69.00W.

Kinsei Kogyo Co., Ltd.: *See*—
Tanigawa, Takatoshi; Yaegashi, Sakari; Nakazawa, Tetsuo; Hatazi, Masahiko; and Nango, Tadao, 4,506,041, Cl. 523-139.000.

Kinugasa, Toshiyuki: *See*—
Ariga, Yoshio; Ishige, Yoshiki; Satoh, Shogi; Tegawa, Masao; Kinugasa, Toshiyuki; and Yamamoto, Toru, 4,505,774, Cl. 156-499.000.

Kipper, Reinhold: *See*—
Piller, Horst; and Kipper, Reinhold, 4,505,555, Cl. 350-527.000.

Kipphan, Helmut: *See*—
Ott, Hans; Boegli, Rolf; Birch, Ulrich; Kipphan, Helmut; and Loffler, Gerhard, 4,505,589, Cl. 356-402.000.

Kirby, Peter L., to Crystalate Electronics Limited. Strain gauge. 4,506,250, Cl. 338-5.000.

Kirchhoff, Hans: *See*—
Beerens, Hugo; Feldmann, Hugo; Gipperich, Theodor; Kirchhoff, Hans; Kusel, Siegfried; Schlanzke, Claus G.; and Nobis, Dieter, 4,505,374, Cl. 198-448.000.

Kirchmayer, Hermann. Solar collector and absorber. 4,505,256, Cl. 126-422.000.

Kirihara, Seishin: *See*—
Usami, Kenichi; Kirihara, Seishin; Doi, Hiroyuki; Asano, Choichi; Sukekawa, Masayuki; and Sakaguchi, Yasuhide, 4,505,232, Cl. 122-511.000.

Kirk, Ronald K., Jr. Bottle-nesting cup with three-position handle. 4,505,390, Cl. 206-547.000.

Kirkham, Steven C.: *See*—
Kramer, Lee F.; Schantz, Ronald K.; Kirkham, Steven C.; and Tschanz, Charles M., 4,505,339, Cl. 172-812.000.

Kirsch, Jerome; Kopsco, M. Alan; Markow, Edward; and Sturm, Michael, to Grumman Aerospace Corporation. Terrain-following transient surface contact vehicle. 4,505,441, Cl. 244-3.150.

Kirsch, Jerome; Kopsco, M. Alan; Markow, Edward; and Sturm, Michael, to Grumman Aerospace Corporation. Transient surface contact vehicle. 4,505,442, Cl. 244-3.150.

Kirsch, Steven T.: *See*—
Haus, Hermann A.; Kirsch, Steven T.; and Leonberger, Frederick J., 4,505,587, Cl. 356-345.000.

Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, to Fanuc Ltd. Numerical control method. 4,506,331, Cl. 364-474.000.

Kishi, Norimasa; Noso, Kazunori; and Futami, Toru, to Nissan Motor Company, Limited. Spoken-instruction controlled system for an automotive vehicle. 4,506,377, Cl. 381-41.000.

Kishi, Norimasa: *See*—
Noso, Kazunori; Kishi, Norimasa; Futami, Toru; Nomura, Hiroyuki; and Shiraishi, Yasuhiro, 4,506,378, Cl. 381-43.000.

Kiss, Marvin L.: *See*—
Bogert, Warren D.; Kiss, Marvin L.; and Yee, Gin W., 4,506,264, Cl. 343-18.00E.

Kissel, Thomas R.: *See*—
Detwiler, Richard L.; Schlegel, Brooke P.; and Kissel, Thomas R., 4,505,801, Cl. 204-418.000.

Kitagawa, Tsutomu: *See*—
Kawamura, Hideo; Otsubo, Isamu; and Kitagawa, Tsutomu, 4,506,145, Cl. 219-499.000.

Kitamura, Yukinori: *See*—
Nagumo, Shuzo; Ogura, Setsuo; and Kitamura, Yukinori, 4,505,766, Cl. 148-175.000.

Klancnik, Alvin R., to Sealy, Incorporated. Fire-resistant mattress and high strength fire-retardant composite. 4,504,991, Cl. 5-459.000.

Klausz, Istvan: *See*—
Asszonyi, Csaba; Klausz, Istvan; Kmety, Istvan; Meitzen, Nandor; and Pasztor, Rezso, 4,505,622, Cl. 405-288.000.

Kleeb, Thomas R.; Criss, George H.; and McCreight, Donald O., to Dresser Industries, Inc. Silica castables. 4,506,025, Cl. 501-124.000.

Kleiber, Herbert: *See*—
Bloch, Samuel; Bressler, Klaus; Idler, Horst; and Kleiber, Herbert, 4,506,332, Cl. 364-483.000.

Klein, Edward P., to Westvaco Corporation. Apparatus for washing paper pulp. 4,505,137, Cl. 68-62.000.

Klein, Gerhard; Arlt, Dieter; and Braden, Rudolf, to Bayer Aktiengesellschaft. Cyclic keto-butyraldehydes a process for their preparation, and their use in the preparation of cyclic diisocyanates. 4,505,860, Cl. 260-453.00A.

Klein, Max. Filtering device for treating contaminated aqueous solutions. 4,505,823, Cl. 210-668.000.

Klesius, Phillip H.; and Brown, Bobby G., to United States of America, Agriculture. Implantation device for use in vivo stimulation and collection of monocytes from peritoneum of vertebrate. 4,505,277, Cl. 128-769.000.

Klingensmith, David R.: *See*—
Campbell, Steven J.; Stickley, Keith A.; and Klingensmith, David R., 4,505,279, Cl. 130-27.00T.

Klockner-Humboldt-Deutz AG: *See*—
Herchenbach, Horst; Seelen, Fritz; Ramesohl, Hubert; Hundgen, Peter; and Schilling, Horst, 4,505,051, Cl. 34-57.00E.

Klockner-Humboldt-Deutz AG, Zweigniederlassung Fahr: *See*—
Lepoix, Louis, 4,505,510, Cl. 296-70.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Jordan, Friedrich, 4,505,238, Cl. 123-193.0CH.

Klok, Alexandr B.: *See*—
Yantsen, Ivan A.; Bekishev, Kenes K.; Savchak, Orest G.; Klok, Alexandr B.; Zhanabaev, Tolgat M.; Pakshtas, Mechislav-Valentinas K.; Glotov, Boris N.; Fink, Garold K.; Timkin, Alexei F.; Zorin, Nikolai I.; and Bobylev, Leonid M., 4,505,340, Cl. 173-134.000.

Kluge, Johannes: *See*—
Karpe, Wolfgang; Kluge, Johannes; and Hasselmann, Heinz, 4,506,242, Cl. 335-120.000.

Kmety, Istvan: *See*—
Asszonyi, Csaba; Klausz, Istvan; Kmety, Istvan; Meitzen, Nandor; and Pasztor, Rezso, 4,505,622, Cl. 405-288.000.

Knapheide Mfg. Co., The: *See*—
Fuchs, Daniel G.; and Rudd, Larry R., 4,505,501, Cl. 292-62.000.

Knight, Lindsay C., to Australasian Training Aids (Pty.) Ltd. Inflatable target apparatus. 4,505,481, Cl. 273-348.100.

Knudson, Gary A. Wide panel, panel assembly. 4,505,084, Cl. 52-528.000.

Knudson, Gary A. Wide panel, panel assembly, and panel forming apparatus. 4,505,143, Cl. 72-187.000.

Kobayashi, Hideki, to Toray Silicone Company, Ltd. Silicone rubber molded products and a method for producing same. 4,505,848, Cl. 252-511.000.

Kobayashi, Hisamine; and Ishihara, Toshiro, to Shikishima Tipton Manufacturing Co., Ltd. Centrifugal rotary barrel-type finishing machine. 4,505,072, Cl. 51-164.200.

Kobayashi, Kazutoshi, to Nakamichi Corporation. Dual capstan drive unit for a tape recorder. 4,505,413, Cl. 226-108.000.

Kobayashi, Kunio: *See*—
Kubota, Isao; Kobayashi, Kunio; and Miyao, Toshimi, 4,506,000, Cl. 430-39.000.

Kobayashi, Masatsune: *See*—
Kanekiyo, Kazue; Kobayashi, Masatsune; Yokoyama, Yasumasa; Eida, Tsuyoshi; Komori, Tomoko; and Koike, Shoji, 4,505,749, Cl. 106-20.000.

Kobayashi, Nobuyoshi; Iwata, Seiichi; Yamamoto, Naoki; Matsuo, Hitoshi; and Homma, Teiichi, to Hitachi, Ltd. Method of producing semiconductor device. 4,505,028, Cl. 29-578.000.

Kobayashi, Tatuhiro: *See*—
Yamane, Masataka; Kusashio, Akira; Kudaka, Satoru; Kobayashi, Tatuhiro; and Ebata, Yasuhiko, 4,505,129, Cl. 62-280.000.

Kobayashi, Yuji: *See*—
Katagi, Takashi; Makino, Shigeru; Tanaka, Hirokazu; and Kobayashi, Yuji, 4,506,270, Cl. 343-914.000.

Koch, Tad H.; and Swanson, Barry J., to University Patents, Inc. Photochemical rearrangement of 2-aminopyrrolin-5-ones to aminocyclopropyl isocyanates and polymers thereof. 4,505,792, Cl. 204-159.110.

Kochetkov, Viktor N.: *See*—
Lykov, Mikhail V.; Lembrikov, Vladimir M.; Golovkina, Svetlana I.; Malakhova, Nadezhda N.; Sterlin, Vladimir N.; Kochetkov, Viktor N.; and Markovin, Gennady M., 4,505,733, Cl. 71-34.000.

Kocide Chemical Corporation: *See*—
Freedenthal, Carol B.; Meyers, Marion D.; and Stoner, Graham A., 4,505,734, Cl. 71-67.000.

Kockums Industri AB: *See*—
Hedlund, Bo P. S.; and Arnoldsson, Eric, 4,505,396, Cl. 212-223.000.

Kodaira, Takanori: *See*—
Hirohata, Michio; and Kodaira, Takanori, 4,505,567, Cl. 354-403.000.

Kodama, Hiroshi: *See*—
Yoshikawa, Shoji; Ohshima, Ken; Kodama, Hiroshi; Yamamiya, Kunio; Sakamoto, Masaharu; and Kato, Kiichi, 4,505,585, Cl. 356-237.000.

Koder, Walter: *See*—
Muller, Leo; Koder, Walter; Brandenstein, Manfred; Walter, Lothar; Edelmann, Ludwig; Bonengel, Roland; and Haas, Roland, 4,505,369, Cl. 192-98.000.

Koenigsberg, William D.; and Wagenknecht, Arthur J., to GTE Laboratories Incorporated. Fluorescent lamp and a base thereof. 4,506,192, Cl. 315-71.000.

Koermer, Gerald S., to Celanese Corporation. Production of linear alkenoic acids and esters. 4,506,095, Cl. 560-205.000.

Koev, Koycho G.; Nedelcheva, Aneliya A.; Todorova, Yasmina S.; and Uzunova, Iglika T., to Vish-Mahinnoelektritechnicheski Institute. Method and device for finely granulizing of sticky or agglomerated materials using controlled vortices. 4,505,432, Cl. 241-29.000.

Koga, Motoyuki, to Hakko Co., Ltd. Method for lining pipes in pipelines. 4,505,613, Cl. 405-154.000.

Koga, Nobuhito: *See*—
Tsuboi, Hikotada; Kawamata, Motoo; Oba, Masayuki; and Koga, Nobuhito, 4,506,042, Cl. 523-454.000.

Kogiso, Osamu: *See*—
Yamamoto, Hisao; and Kogiso, Osamu, 4,505,956, Cl. 427-393.100.

Kogure, Toshiharu, to Seiko Seiki Kabushiki Kaisha. Grinding machine control system for intermittently measuring workpiece size. 4,505,074, Cl. 51-165.770.

Kohler, Bernard, to Sedis Compagnie des Transmissions Mecaniques. Universal tightener for a transmission chain or belt. 4,505,691, Cl. 474-101.000.

Kohlhaas, Oswin: *See*—
Lincke, Paul; Kohlhaas, Oswin; and Wahhoud, Adnan, 4,505,306, Cl. 139-435.000.

Koide, Hiroshi: *See*—
Shinoda, Kazuo; Miyaki, Masahiko; Masuda, Akira; and Koide, Hiroshi, 4,505,240, Cl. 123-357.000.

Koike, Shoji: *See*—
Kanekiyo, Kazue; Kobayashi, Masatsune; Yokoyama, Yasumasa; Eida, Tsuyoshi; Komori, Tomoko; and Koike, Shoji, 4,505,749, Cl. 106-20.000.

Koitabashi, Toshimitsu: *See*—
Hamada, Takao; Tsuchiya, Nobuo; Ito, Yo; Inatani, Toshihiro; Takada, Yoshiyasu; Sumito, Mitsuo; Koitabashi, Toshimitsu; and Katayama, Hideshi, 4,505,745, Cl. 75-129.000.

Koizumi, Yutaka, to Ricoh Company, Ltd. Toner powder collection device. 4,505,577, Cl. 355-15.000.

Kojima, Takemasa; Tabata, Kengo; Yanaki, Toshio; and Mitani, Mitsuaki, to Kaken Pharmaceutical Co. Ltd.; and Taito Co., Ltd. Method for a specific depolymerization of a polysaccharide having a rod-like helical conformation. 4,505,757, Cl. 127-36.000.

Kojima, Yoshihiko: *See*—
Suzuki, Michihiko; Kawaguchi, Katsukiyo; and Kojima, Yoshihiko, 4,505,946, Cl. 427-29.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Akiba, Shigeyuki; Sakai, Kazuo; Utaka, Katsuyuki; and Matsushima, Yuichi, 4,506,367, Cl. 372-45.000.
Furusawa, Kahei; Nunokawa, Makoto; Ejiri, Yoshihiro; Yamamoto, Hitoshi; Yamazaki, Yoshihiko; and Tatekura, Koichi, 4,505,540, Cl. 350-96.200.
Shirakami, Toshiaki, 4,506,289, Cl. 358-22.000.

Komagata, Hideki: *See*—
Shimada, Masayoshi; Komagata, Hideki; and Iizuka, Yasuhiro, 4,505,994, Cl. 429-101.000.

Komatsu, Akira, to Bodysonic Kabushiki Kaisha. Method and system for discriminating human voice signal. 4,506,379, Cl. 381-46.000.

Komatsu, Kazuyuki, to Kabushiki Kaisha Daini Seikosha. Multicolor thermal transfer recorder with color detection means. 4,506,273, Cl. 346-76.0PH.

Komori, Tomoko: *See*—
Kanekiyo, Kazue; Kobayashi, Masatsune; Yokoyama, Yasumasa; Eida, Tsuyoshi; Komori, Tomoko; and Koike, Shoji, 4,505,749, Cl. 106-20.000.

Kondo, Katsuya; and Tajima, Shigeru, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Method of controlling mill motors speeds in a cold tandem mill. 4,506,197, Cl. 318-34.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Ashida, Hisashi; and Suzuki, Keiichiro, 4,505,572, Cl. 355-3.00R.
Noguchi, Michihiro, 4,505,566, Cl. 354-400.000.

Konomi, Masaaki. Spectroscopic analyzer system for examining intravital tissue. 4,505,583, Cl. 356-73.000.

Koppe, Herbert: *See*—
Kummer, Werner; Koppe, Herbert; Stahle, Helmut; Reichl, Richard; and Kuhn, Franz J., 4,505,912, Cl. 514-236.000.

Kopsco, M. Alan: *See*—
Kirsch, Jerome; Kopsco, M. Alan; Markow, Edward; and Sturm, Michael, 4,505,441, Cl. 244-3.150.
Kirsch, Jerome; Kopsco, M. Alan; Markow, Edward; and Sturm, Michael, 4,505,442, Cl. 244-3.150.

Korolkov, Ivan A.: *See*—
Utyamyshev, Rustam I.; Smirnov, Boris A.; Kanshin, Nikolai N.; Korolkov, Ivan A.; and Ivanova, Tatyana L., 4,505,272, Cl. 128-305.000.

Koroncai, Adam I.; and Poetsch, Edmund R., to Siemens Aktiengesellschaft. Power rectifier arrangement. 4,506,320, Cl. 363-141.000.

Korotkikh, Jury B.: *See*—
Bragin, Boris F.; Korotkikh, Jury B.; Markuntovich, Felix D.; and Olofinsky, Evgeny P., 4,505,452, Cl. 251-326.000.

Korzhov, Viktor I.: *See*—
Telis, Alexandr I.; Epishin, Pavel P.; Korzhov, Viktor I.; Makarov, Gennady A.; Kotlyarenko, Iosif Y.; and Grischenko, Nikolai V., 4,506,143, Cl. 219-497.000.

Koshihara, Atsuo: *See*—
Isogai, Sakichi; Mizuhata, Teruo; Takahashi, Masaaki; Imai, Takayoshi; Nakanishi, Kazuyoshi; Ito, Takefumi; and Koshihara, Atsuo, 4,505,397, Cl. 212-232.000.

Kotlyarenko, Iosif Y.: *See*—
Telis, Alexandr I.; Epishin, Pavel P.; Korzhov, Viktor I.; Makarov, Gennady A.; Kotlyarenko, Iosif Y.; and Grischenko, Nikolai V., 4,506,143, Cl. 219-497.000.

Koumura, Masahiko: *See*—
Mizuno, Sueo; Mizutani, Katsushi; and Koumura, Masahiko, 4,505,253, Cl. 126-351.000.

Koutavas, Samuel G.: *See*—
Bennett, James W.; Howe, Gary L.; Jaakola, Kenneth A.; and Koutavas, Samuel G., 4,506,138, Cl. 219-205.000.

Koval, Alexander; and Whitlow, H. Donald, to Blue Mountain Industries. Turf conditioning apparatus. 4,505,338, Cl. 172-611.000.

Kowa Co., Ltd.: *See*—
Mori, Toshihito; Yoshizaki, Hideo; and Hasegawa, Akio, 4,505,893, Cl. 424-94.000.

Koyama, Kenichi: *See*—
Onishi, Toshitada; Tateishi, Hiroshi; Koyama, Kenichi; Saito, Shigeo; and Nagata, Masayuki, 4,506,109, Cl. 174-128.00S.

Kozai, Katsuya, to Fuji Photo Film Co., Ltd. Camera back. 4,505,560, Cl. 354-86.000.

Kozak, William G.: *See*—
Sumner, William C., Jr.; Hoyer, Gale G.; and Kozak, William G., 4,505,885, Cl. 423-592.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Brunner, Gerd; Hoffmann, Rainer; and Kunstle, Konrad, 4,505,808, Cl. 208-11.00R.
Brunner, Gerd; Hoffmann, Rainer; and Kunstle, Konrad, 4,505,809, Cl. 208-11.00R.
Krall, Donald J., to Kendale Industries, Inc. Thrust bearing and method of making same. 4,505,524, Cl. 384-615.000.
Kramer, Erhardt; Moller, Dieter; and Brauer, Ralph, to Benz & Hilgers GmbH. Machine for dosing, filling and packaging of a doughy or pasty food substance. 4,505,311, Cl. 141-129.000.
Kramer, Lee F.; Schantz, Ronald K.; Kirkham, Steven C.; and Tschanz, Charles M., to Dresser Industries, Inc. Hydraulic control for a dozer blade. 4,505,339, Cl. 172-812.000.
Kramer, Wolfgang: *See*—
Jager, Gerhard; Buchel, Karl H.; Kramer, Wolfgang; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,505,922, Cl. 514-383.000.
Kranz, Jurgen, to Metzeler Kautschuk GmbH. Apparatus for electrostatically coating elongated workpieces with flock. 4,505,224, Cl. 118-636.000.
Krasselt, Manfred M.: *See*—
Apontoweil, Peter; and Krasselt, Manfred M., 4,505,892, Cl. 424-89.000.
Kratt, Kurt, to J. Hengstler K.G. Resettable mechanical counter. 4,506,373, Cl. 377-88.000.
Krause, Joachim: *See*—
Romer, Michael; Krause, Joachim; and Weber, Georg, 4,505,838, Cl. 252-299.630.
Krause, Norbert, to Siemens Aktiengsellschaft. High-frequency field system for nuclear magnetic resonance apparatus. 4,506,224, Cl. 324-319.000.
Krieger, Karl: *See*—
Welzel, Josef; and Krieger, Karl, 4,505,299, Cl. 137-596.100.
Kristofferson, Clifford E.: *See*—
Barnes, Michael W.; Kristofferson, Clifford E.; and Manzara, Anthony P., 4,506,069, Cl. 528-232.000.
Krone GmbH: *See*—
Rott, Joachim; Thelen, Wolfgang; and Hesselbrock, Bernd, 4,506,353, Cl. 367-91.000.
Kroon, Daniel: *See*—
Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, 4,505,853, Cl. 260-112.50R.
Krueger, Gordon P.; Lund, Anders E.; and Adams, Roy D., to Michigan Technological University, Board of Control of. Fan-shaped loader for making a loosely felted mat of aligned wood flakes. 4,505,371, Cl. 198-382.000.
Krueger, Gordon P.; Lund, Anders E.; and Adams, Roy D., to Michigan Technological University, Board of Control of. Apparatus for forming mat of aligned flake composite wood material with continuous baffles. 4,505,868, Cl. 264-108.000.
Krull, Klaus, to Licentia Patent-Verwaltungs-GmbH. Service integrated digital transmission system operating in time multiplex. 4,506,356, Cl. 370-1.000.
Krupp Koppers GmbH: *See* –
Goeke, Eberhard; and Ludolph, Jurgen, 4,505,719, Cl. 48-202.000.
Kruse, John M.: *See*—
Wright, William H.; and Kruse, John M., 4,505,696, Cl. 493-130.000.
Krutzler, James: *See*—
Holt, Anne; and Krutzler, James, 4,505,222, Cl. 118-304.000.
Kryskow, J. Michael, Jr.; and Tanzman, Allan, to Gould Inc. Multi-station token pass communication system and method. 4,506,360, Cl. 370-85.000.
Kubo, Hiroshi: *See*—
Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,505,739, Cl. 71-92.000.
Kubo, Mituru: *See*—
Itoh, Masahiko; Midorikawa, Heihatiro; Minato, Akira; Kubo, Mituru; Ito, Takehiko; and Katayama, Kiichiro, 4,505,760, Cl. 148-6.15R.
Kubota, Isao; Kobayashi, Kunio; and Miyao, Toshimi, to Sony Corporation. Magnetic recording medium. 4,506,000, Cl. 430-39.000.
Kucera, Carrell J., to Norden Laboratories, Inc. Modified *Pasteurella haemolytica* bacteria. 4,506,017, Cl. 435-253.000.
Kuchar, Paul J.; Sampson, Robert W.; and Pacanowski, Ronald F., to UOP Inc. Humidity monitor and method. 4,505,147, Cl. 73-29.000.
Kuchenbecker, Morris W., to James River-Norwalk, Inc. Cook-in carton with improved integral support structure. 4,505,391, Cl. 206-622.000.
Kudaka, Satoru: *See*—
Yamane, Masataka; Kusashio, Akira; Kudaka, Satoru; Kobayashi, Tatuhiro; and Ebata, Yasuhiko, 4,505,129, Cl. 62-280.000.
Kuhn, Franz J.: *See*—
Kummer, Werner; Koppe, Herbert; Stahle, Helmut; Reichl, Richard; and Kuhn, Franz J., 4,505,912, Cl. 514-236.000.
Kuhnlein, Klaus, to AEG-Kanis Turbinenfabrik GmbH. Method and apparatus for measuring and monitoring the rate of rotation of fast running machines. 4,506,339, Cl. 364-565.000.
Kulkarni, Murlidhar V.: *See*—
Cadwallader, Robert H.; Edmonds, Harold D.; and Kulkarni, Murlidhar V., 4,506,158, Cl. 250-338.000.
Kumano, Takeshi: *See*—
Tomiyori, Takashi; Fukuda, Misao; Yamashita, Iwao; Simizu, Nobuo; and Kumano, Takeshi, 4,505,073, Cl. 51-165.00R.
Kume, Hiroshi, to Fuji Xerox Co., Ltd. Retransmission control system. 4,506,361, Cl. 370-85.000.
Kummer, Werner; Koppe, Herbert; Stahle, Helmut; Reichl, Richard; and Kuhn, Franz J., to Boehringer Ingelheim KG. 5-Anilino-1,2,3-triazole-4-carboxylic acid compounds. 4,505,912, Cl. 514-236.000.
Kuno, Toshitaka; and Ikeda, Toshiaki, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method of measuring origin of moving section in robot and apparatus therefor. 4,505,049, Cl. 33-333.000.
Kunstle, Konrad: *See*—
Brunner, Gerd; Hoffmann, Rainer; and Kunstle, Konrad, 4,505,808, Cl. 208-11.00R.
Brunner, Gerd; Hoffmann, Rainer; and Kunstle, Konrad, 4,505,809, Cl. 208-11.00R.
Kuo, Samuel C., to GTE Products Corporation. Log-periodic antenna. 4,506,268, Cl. 343-792.500.
Kurata, Masami; Saitoh, Hiroyuki; and Matsuda, Masakane, to Fuji Xerox Co., Ltd. Copying machine. 4,505,574, Cl. 355-14.00E.
Kurata, Masami, to Fuji Xerox Co., Ltd. Cut sheet facsimile. 4,506,302, Cl. 358-285.000.
Kurata, Tomoyuki: *See*—
Dan, Takuya; Watanabe, Isao; and Kurata, Tomoyuki, 4,505,462, Cl. 267-140.200.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Fukuda, Hiroyuki; Kaji, Hisatsugu; Fujimaki, Hiroto; Yamanobe, Yoichiro; Hiruta, Masaru; and Ohmi, Sigeru, 4,506,028, Cl. 502-101.000.
Kurkov, Victor P., to Chevron Research Company. Heterocyclic electroactive polymers. 4,505,840, Cl. 252-500.000.
Kurkov, Victor P.; Schroeder, Albert H.; Denisevich, Peter, Jr.; and Suzuki, Shigeto, to Chevron Research Company. Heteroazole electroactive polymers. 4,505,842, Cl. 252-500.000.
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Suzuki, Shigeto; Kurkov, Victor P.; Schroeder, Albert H.; and Denisevich, Peter, Jr., 4,505,843, Cl. 252-500.000.
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Scheurenberg, Helmut; and Funke, Manfred, 4,505,355, Cl. 180-308.000.

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Lu, Pang-Chia, to Mobil Oil Corporation. Microwavable heat and grease resistant containers and method for their preparation. 4,505,961, Cl. 428-35.000.

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Krueger, Gordon P.; Lund, Anders E.; and Adams, Roy D., 4,505,371, Cl. 198-382.000.
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Machara, Toshifumi, to Akebono Brake Industry Co., Ltd. Device for preventing vehicle wheels from locking. 4,505,520, Cl. 303-119.000.

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Majima, Osamu, to Sony Corporation. Thermal transfer printing method and printing paper therefor. 4,505,975, Cl. 428-336.000.

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Mandon, Jean-Pierre, to Airwick Industries, Inc. Dispenser for air treating material. 4,505,429, Cl. 239-56.000.

Mangano, Mary G. Adjustable bookmark for paperback and hard cover books. 4,505,219, Cl. 116-234.000.

Mann, Arnold: *See*—
Sauerschell, Wolfgang; Ruschek, Gerhard; and Mann, Arnold, 4,505,151, Cl. 73-116.000.

Mannesmann Aktiengesellschaft: *See*—
Boos, Jurgen; Homersen, Achim; and Schirmag, Klaus-Peter, 4,505,692, Cl. 474-111.000.
Jung, Helmut; Pempera, Franz G.; and Riedesel, Udo, 4,505,050, Cl. 34-54.000.

Karpe, Wolfgang; Kluge, Johannes; and Hasselmann, Heinz, 4,506,242, Cl. 335-120.000.
Mann's Wine Co., Ltd.: *See*—
Togawa, Hideo; Takezawa, Taihei; Watanabe, Masazumi; Hayashi, Kazuya; and Okuhara, Akira, 4,505,938, Cl. 426-46.000.
Mansell, Barry N.; and Friedman, David, to Computervision Corporation. Method and apparatus for displaying objects on an interlaced raster scan television screen. 4,506,298, Cl. 358-160.000.
Mansion Industries, Inc.: *See*—
Zieg, Steven A., 4,505,456, Cl. 256-67.000.
Manson, James E. X-Ray calibration system. 4,506,375, Cl. 378-207.000.
Mansour, Mansour N., to Southern California Edison. Method and burner tip for suspressing emissions of nitrogen oxides. 4,505,665, Cl. 431-10.000.
Manzara, Anthony P.: *See*—
Barnes, Michael W.; Kristofferson, Clifford E.; and Manzara, Anthony P., 4,506,069, Cl. 528-232.000.
MAPA GmbH Gummi- und Plastikwerke: *See*—
Kesselring, Lutz, 4,505,398, Cl. 215-11.00B.
Maples, Stephen S., to Acer Automation Company. Thermal compensating gage. 4,505,158, Cl. 73-766.000.
Marathon Oil Company: *See*—
Plummer, Mark A.; and Bugle, Robert C., 4,505,810, Cl. 208-108.000.
Sydansk, Robert D., 4,505,751, Cl. 106-84.000.
Marcus, Arnold D.: *See*—
Sheinaus, Harold; and Marcus, Arnold D., 4,505,862, Cl. 260-501.180.
Mareau, Dominique, to Gimar S.A. Belt conveyor. 4,505,382, Cl. 198-819.000.
Marianelli, Giorgio: *See*—
Barbieri, Raul; and Marianelli, Giorgio, 4,505,596, Cl. 368-236.000.
Marine Construction & Design Co.: *See*—
Cook, Harold T., Jr., 4,505,062, Cl. 43-6.500.
Maring, Thomas L.: *See*—
Lorenc, Allan L.; and Maring, Thomas L., 4,505,472, Cl. 272-1.00C.
Mariol, James F. Convertible toy. 4,505,686, Cl. 446-95.000.
Mariotti, Rene G., to Friteco, Inc. Industrial deep-fryer. 4,505,193, Cl. 99-330.000.
Mark, Victor, to General Electric Company. Flame retardant polycarbonate compositions. 4,506,046, Cl. 524-83.000.
Mark, Victor, to General Electric Company. Amide and carbamate terminated copolyester-carbonates. 4,506,064, Cl. 528-176.000.
Markley, Lowell D.; Tong, Yulan C.; and Wood, Steven G., to Dow Chemical Company, The. Sulfur-substituted diphenyl ethers having antiviral activity. 4,505,929, Cl. 514-520.000.
Markovin, Gennady M.: *See*—
Lykov, Mikhail V.; Lembrikov, Vladimir M.; Golovkina, Svetlana I.; Malakhova, Nadezhda N.; Sterlin, Vladimir N.; Kochetkov, Viktor N.; and Markovin, Gennady M., 4,505,733, Cl. 71-34.000.
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Kirsch, Jerome; Kopsco, M. Alan; Markow, Edward; and Sturm, Michael, 4,505,441, Cl. 244-3.150.
Kirsch, Jerome; Kopsco, M. Alan; Markow, Edward; and Sturm, Michael, 4,505,442, Cl. 244-3.150.
Markowitz, Harold T.; Rueter, John C.; and Duffin, Edwin G., to Medtronic, Inc. Device for detecting retrograde conduction. 4,505,276, Cl. 128-697.000.
Marks, Robert E.; Burton, James S.; Elvidge, John A.; and Shah, Saresh. Derivatives of acetylsalicylic acid and substituted phenylacetic acids and compositions containing them. 4,505,898, Cl. 514-18.000.
Markuntovich, Felix D.: *See*—
Bragin, Boris F.; Korotkikh, Jury B.; Markuntovich, Felix D.; and Olofinsky, Evgeny P., 4,505,452, Cl. 251-326.000.
Markus, Michael V.: *See*—
Barnett, George H.; and Markus, Michael V., 4,506,035, Cl. 521-53.000.
Marrakchi El Fellah, Abdellatif: *See*—
Huignard, Jean-Pierre; and Marrakchi El Fellah, Abdellatif, 4,505,536, Cl. 350-3.640.
Marraud, Alain R. P.; and Bonnet, Maurice G. Q., to Centre National de la Recherche Scientifique. Method and device for three-dimensional visualization from video signals, notably for electron microscopy. 4,506,296, Cl. 358-88.000.
Marshall, Marshall W., to Tyler Pipe. Adjustably extensible roof drain receptacle. 4,505,814, Cl. 210-166.000.
Marshall, Vincent P.: *See*—
Argoudelis, Alexander D.; Marshall, Vincent P.; and Wiley, Paul F., 4,505,895, Cl. 424-117.000.
Martenas, Wayne B.; and Priepke, Edward H., to Sperry Corporation. Forage harvester recutter screen. 4,505,434, Cl. 241-89.300.
Martin, Chloeta Fay: *See*—
Martin, Theodore O., Jr., 4,505,971, Cl. 428-216.000.
Martin, Hans, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG. Fluid friction clutch. 4,505,367, Cl. 192-58.00B.
Martin, Henry: *See*—
Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,505,742, Cl. 71-93.000.
Martin, John S., to Engineering Patents & Equipment Limited. Aircraft ejection seat system. 4,505,444, Cl. 244-122.0AE.
Martin, Richard R.; and Jaeger, Kurt S., to John Zink Company. Staged fuel and air for low NO_x burner. 4,505,666, Cl. 431-175.000.
Martin, Ricky T., Sr. Archery broadhead. 4,505,482, Cl. 273-421.000.
Martin, Ted, Jr.: *See*—
Martin, Theodore O., Jr., 4,505,971, Cl. 428-216.000.
Martin, Tellis A.: *See*—
Dolak, Terence M.; and Martin, Tellis A., 4,505,911, Cl. 514-229.000.
Martin, Theodore O., Jr., to Martin, Ted, Jr.; and Martin, Chloeta Fay. Fluoroplastic and metal laminate having rubber compound bonded layers. 4,505,971, Cl. 428-216.000.
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Bank, Herbert M.; and Rubenstein, Irving H., 4,505,220, Cl. 118-16.000.
Masaoka, Toshika: *See*—
Tokui, Masaaki; Masaoka, Toshika; and Ota, Atsushi, 4,505,318, Cl. 164-113.000.
Maschinenfabrik Ernst Thielenhaus GmbH: *See*—
Schwar, Rudolf, 4,505,071, Cl. 51-3.000.
Maschinenfabrik Ettlingen Friedrich Pfeiffer KG: *See*—
Muller, Werner, 4,505,658, Cl. 425-117.000.
Maschinenfabrik J. Dieffenbacher GmbH & Co.: *See*—
Bielfeldt, Friedrich B., 4,505,661, Cl. 425-190.000.
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Mase, Syunzo; and Soejima, Shigeo, to NGK Insulators, Ltd. Oxygen concentration regulation. 4,505,790, Cl. 204-130.000.
Mase, Syunzo; and Soejima, Shigeo, to NGK Insulators, Ltd. Oxygen concentration detector. 4,505,802, Cl. 204-425.000.
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Massachusetts General Hospital: *See*—
Bruns, Romaine R.; and Gross, Jerome, 4,505,855, Cl. 260-123.700.
Massachusetts Institute of Technology: *See*—
Haus, Hermann A.; Kirsch, Steven T.; and Leonberger, Frederick J., 4,505,587, Cl. 356-345.000.
Yannas, Ioannis V.; and Burke, John F., 4,505,266, Cl. 128-1.00R.
Massey, James L.; and Schaub, Thomas, to LGZ Landis & Gyr Zug AG. Method and apparatus for recognizing in a receiver the start of a telegram signal consisting of a bit impulse sequence. 4,506,372, Cl. 375-116.000.
Massie, Claude P. Bracket for fire extinguishers. 4,505,448, Cl. 248-313.000.
Masteller, Bill L.: *See*—
Miller, Ronald P.; Chiles, William H.; and Masteller, Bill L., 4,506,348, Cl. 365-73.000.
Masters, Ian M.: *See*—
Weir, Donald R.; Masters, Ian M.; and Bolton, Gerald L., 4,505,744, Cl. 75-120.000.
Masuda, Akira: *See*—
Shinoda, Kazuo; Miyaki, Masahiko; Masuda, Akira; and Koide, Hiroshi, 4,505,240, Cl. 123-357.000.
Masuda, Kosaku; and Tashiro, Shuichirow, to Jidosha Kiki Co., Ltd. Vane pumps. 4,505,649, Cl. 417-300.000.
Matcon Radgivende Ingeni rfirma ApS.: *See*—
Joensen, Jon O., 4,505,004, Cl. 17-48.000.
Matoba, Hiroshi: *See*—
Chijiishi, Toshio; Matoba, Hiroshi; Nakamura, Kazuo; and Higuchi, Toshiaki, 4,505,659, Cl. 425-121.000.
Matsu, Toshi: *See*—
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Matsubara, Kentaro: *See*—
Matsuo, Yoshio; and Matsubara, Kentaro, 4,505,428, Cl. 238-349.000.
Matsuda, Masakane: *See*—
Kurata, Masami; Saitoh, Hiroyuki; and Matsuda, Masakane, 4,505,574, Cl. 355-14.00E.
Matsuda, Yasuhiko: *See*—
Sato, Yo; Kashiwaba, Tadao; Matsuda, Yasuhiko; and Oikawa, Tadahisa, 4,505,773, Cl. 156-384.000.
Matsui, Shinichi, to Nissan Motor Company, Limited. Method and apparatus for controlling the sound field in a vehicle cabin or the like. 4,506,380, Cl. 381-71.000.
Matsumura, Hiroyoshi; Katsuyama, Toshio; and Suganuma, Tsuneo, to Hitachi, Ltd. Method of producing optical fiber preform. 4,505,729, Cl. 65-3.110.
Matsuo, Hitoshi: *See*—
Kobayashi, Nobuyoshi; Iwata, Seiichi; Yamamoto, Naoki; Matsuo, Hitoshi; and Homma, Teiichi, 4,505,028, Cl. 29-578.000.
Matsuo, Yoshio; and Matsubara, Kentaro, to Tetsudo Kizai Kogyo Company Limited. Rail fastening device. 4,505,428, Cl. 238-349.000.
Matsuo, Yoshitaka: *See*—
Makino, Kenya; Sakurai, Hideo; Toyoda, Toshiyuki; and Matsuo, Yoshitaka, 4,506,061, Cl. 526-142.000.
Matsuoka, Hideaki, to Warner-Ishi. Turbocharged internal combustion engine having an engine driven positive displacement compressor. 4,505,117, Cl. 60-609.000.
Matsushima, Yuichi: *See*—
Akiba, Shigeyuki; Sakai, Kazuo; Utaka, Katsuyuki; and Matsushima, Yuichi, 4,506,367, Cl. 372-45.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Arai, Shoji, 4,506,272, Cl. 346-76.0PH.
Kakimoto, Atsushi; Takita, Masaaki; and Watanabe, Shinichi, 4,505,469, Cl. 271-91.000.

Makimoto, Mitsuo; Aihara, Yukichi; and Yamashita, Sadahiko, 4,506,241, Cl. 333-222.000.
Nakajima, Toyohei; and Hosokawa, Takehiko, 4,505,246, Cl. 123-489.000.
Naruo, Noboru; and Kawanishi, Hidekata, 4,506,251, Cl. 338-238.000.
Takano, Teruhisa; and Ueda, Shigeki, 4,506,142, Cl. 219-490.000.
Uya, Masaru, 4,506,168, Cl. 307-290.000.
Yamane, Masataka; Kusashio, Akira; Kudaka, Satoru; Kobayashi, Tatuhiro; and Ebata, Yasuhiko, 4,505,129, Cl. 62-280.000.

Matsushita, Souichi: *See*—
Kanda, Mutsumi; Matsushita, Souichi; Nakanishi, Kiyoshi; and Inoue, Tokuta, 4,505,233, Cl. 123-41.350.

Matteson, Ronald G.: *See*—
Kingsley, William; Stoffel, James C.; Moreland, John F., Jr.; Matteson, Ronald G.; Wiggins, Douglas G.; and Allis, Robert F., 4,506,301, Cl. 358-280.000.

Matthews, Billie J.; and Bornslaeger, S. Richard, to Kimberly-Clark Corporation. Sanitary napkin with following baffle. 4,505,705, Cl. 604-385.000.

Mattox, Ernest M. Weighted elastomeric jumping device. 4,505,474, Cl. 272-75.000.

Matzek, Lester T., to Rockwell International Corporation. Adjustable slope equalizer. 4,506,237, Cl. 333-28.00R.

Matzkin, Harry; and Getto, Leslie. Door lock cover. 4,505,504, Cl. 292-337.000.

Max-Planck-Institut zur Foerderung der Wissenschaften e.V.: *See*—
Claussen, Nils; and Petzow, Gunter, 4,506,024, Cl. 501-105.000.

May & Baker Limited: *See*—
Hatton, Leslie R.; Parnell, Edgar W.; and Roberts, David A., 4,505,740, Cl. 71-92.000.
Lucas, Joshua M. S., 4,505,711, Cl. 604-892.000.

Mayer, Arnold H., to United States of America, Air Force. Heat management system for aircraft. 4,505,124, Cl. 62-180.000.

Mayer, Carl W., to Ciba-Geigy Corporation. Process for producing 3,4,9,10-tetrathioperylene and 3,4,9,10-tetraselenoperylene. 4,505,858, Cl. 260-239.00R.

Mayer, Ferdy. EMI Protected cable, with controlled symmetrical-/asymmetrical mode attenuation. 4,506,235, Cl. 333-12.000.

Mazin, Moshe; and Engeler, William E., to General Electric Company. Cross-coupled transistor memory cell for MOS random access memory of reduced power dissipation. 4,506,349, Cl. 365-189.000.

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Alloca, Robert E.; and Mazon, Meyer I., 4,505,647, Cl. 417-252.000.

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Sangiorgi, Mario, 4,505,366, Cl. 192-18.00B.

Mazziotti, Philip J., to Zeller Corporation, The. Mounting for a bearing cup of a universal joint. 4,505,689, Cl. 464-130.000.

McCabe, Robert J.: *See*—
Evans, William P.; McCabe, Robert J.; and Naviasky, Eric H., 4,506,171, Cl. 307-362.000.

McCaully, Ronald J.: and Kim, Dong H., to American Home Products Corporation. Tin complexes of indoline-2-carboxylic acids and esters prepared from o-nitrophenylpyruvic acids and esters. 4,506,077, Cl. 548-402.000.

McCrary, Frank R. Wood splitter's aid tool. 4,505,465, Cl. 269-130.000.

McCreight, Donald O.: *See*—
Kleeb, Thomas R.; Criss, George H.; and McCreight, Donald O., 4,506,025, Cl. 501-124.000.

McDonald, James S., to AT&T Technologies, Inc. Air distributor for sequentially controlling air operated apparatus. 4,505,184, Cl. 91-39.000.

McGaffigan, Thomas H.: *See*—
Hine, Jean-Patrick; and McGaffigan, Thomas H., 4,505,532, Cl. 339-75.00M.

McGann, William E., to Harris Corporation. Method and apparatus for relaying signals between a ground station and a satellite using a ground relay station. 4,506,383, Cl. 455-17.000.

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Weydt, Willy V. D.; Hannen, Ulrich; and Paetzel, Herbert, 4,505,188, Cl. 92-94.000.

McLemore, Michael; and Chandler, Ronald, to Central Mfg., Inc. Fluid pressure operated reciprocating conveyor. 4,505,380, Cl. 198-750.000.

McMaster, Harold A., to Glasstech, Inc. Glass sheet roller conveyor furnace including gas jet pump heating. 4,505,671, Cl. 432-144.000.

McNeel, William O.; and Sackett, James A., to Litton Resources Systems, Inc. Accelerometer manufacturing method. 4,505,014, Cl. 29-25.350.

Mead Johnson & Company: *See*—
Dolak, Terence M.; and Martin, Tellis A., 4,505,911, Cl. 514-229.000.

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Measurex Corporation: *See*—
Boissevain, Mathew G., 4,505,779, Cl. 162-199.000.

Meddaugh, Michael D., to Dow Corning Corporation. Mineral particles bound with silicone elastomeric emulsion. 4,505,955, Cl. 427-393.000.

Medem, Harald; Schreckenberg, Manfred; Dhein, Rolf; Nouvertne, Werner; and Rudolph, Hans, to Bayer Aktiengesellschaft. Thermoplastic polycarbonates, their preparation and their use as shaped articles and films. 4,506,066, Cl. 528-196.000.

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Markowitz, Harold T.; Rueter, John C.; and Duffin, Edwin G., 4,505,276, Cl. 128-697.000.

Meibuhr, George C. Bearing locknut. 4,505,628, Cl. 411-123.000.

Meier, Hans; and Staheli, Werner, to Sulzer Brothers Limited. Lubricant monitoring system. 4,505,186, Cl. 92-5.00R.

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Gray, Keith I.; and Meier, Henry G., 4,506,110, Cl. 174-144.000.

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Jones, Gary V.; Meinhold, James F.; and Musto, Joseph A., 4,505,940, Cl. 426-424.000.

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Price, Vera H.; and Menefee, Emory, 4,504,998, Cl. 15-186.000.

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Schneider, Bernhard; and Menges, Horst, 4,505,181, Cl. 89-33.040.

Menon, Govind K.; and Sanders, Winfred J., to SmithKline Beckman Corporation. Feed compositions containing a (1-oxo-2-pyridyl) disulfide. 4,505,917, Cl. 514-347.000.

Merck & Co., Inc.: *See*—
Hannah, John, 4,505,915, Cl. 514-193.000.
Hoffman, Jacob M., Jr.; and Woltersdorf, Otto W., Jr., 4,505,923, Cl. 514-229.000.
Huff, Joel R.; Saari, Walfred S.; and Baldwin, John J., 4,505,918, Cl. 514-341.000.
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Romer, Michael; Pohl, Ludwig; and Eidenschink, Rudolf, 4,505,837, Cl. 252-299.600.
Romer, Michael; Krause, Joachim; and Weber, Georg, 4,505,838, Cl. 252-299.630.

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Aigner, Heinrich; Merget, Norbert; Norden, Jurgen; Schweppe, Manfred; and Wetter, Klaus, 4,505,732, Cl. 71-11.000.

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Gottzein, Eveline; Keeve, Rolf; and Surauer, Michael, 4,505,206, Cl. 104-284.000.

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Baab, Heribert, 4,505,724, Cl. 55-118.000.

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Smyth, Richard T.; and Zatorski, Raymond A., 4,506,136, Cl. 219-121.0PL.

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Rodgers, Michael C.; and Michels, Geoffrey H., 4,505,430, Cl. 239-112.000.
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Kilpela, Tauno B., 4,505,663, Cl. 425-363.000.
Krueger, Gordon P.; Lund, Anders E.; and Adams, Roy D., 4,505,371, Cl. 198-382.000.
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Mieyal, David F., to Donn Incorporated. Delineated ceiling grid in suspended ceiling. 4,505,083, Cl. 52-476.000.
Miles, Betty J. Fluid administration splint. 4,505,270, Cl. 128-88.000.
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Millard, Mary A. Skin treatment preparation. 4,505,902, Cl. 424-195.100.
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Miller, Edwin A. Socket terminal and connector. 4,505,531, Cl. 339-64.00R.
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Minato, Akira: *See*—
Itoh, Masahiko; Midorikawa, Heihatiro; Minato, Akira; Kubo, Mituru; Ito, Takehiko; and Katayama, Kiichiro, 4,505,760, Cl. 148-6.15R.
Miners, Kamal E. B., to Allied Corporation. Portable SF_6 decomposition sensor. 4,505,146, Cl. 73-19.000.
Minnesota Mining and Manufacturing Company: *See*—
Bailey, Terry R., 4,505,967, Cl. 428-164.000.
Gabor, Thomas; Broberg, David E.; Dierssen, Gunther H.; and Rowennorst, Donley D., 4,505,720, Cl. 51-295.000.
Larimore, Franklin C., 4,505,770, Cl. 156-235.000.
Reidt, Dean K., 4,505,034, Cl. 29-749.000.
Minuth, Walter: *See*—
Esser, Karl; and Minuth, Walter, 4,506,014, Cl. 435-172.300.
Mirhej, Michael E., to Du Pont de Nemours, E. I., and Company. Process for polyester yarns. 4,505,867, Cl. 264-103.000.
Miskel, John J., Jr.: *See*—
Lipowski, Stanley A.; and Miskel, John J., Jr., 4,505,828, Cl. 252-8.55D.
Lipowski, Stanley A.; Miskel, John J., Jr.; and Schick, Martin J., 4,505,833, Cl. 252-8.50C.
Mita Industrial Co. Ltd.: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; and Shigemura, Yutaka, 4,505,571, Cl. 355-3.0SH.
Mitani, Mitsuaki: *See*—
Kojima, Takemasa; Tabata, Kengo; Yanaki, Toshio; and Mitani, Mitsuaki, 4,505,757, Cl. 127-36.000.
Mitani, Shinji: *See*—
Akamine, Kazuhiko; Ebara, Katsuya; Ito, Kazuyuki; and Mitani, Shinji, 4,505,824, Cl. 210-695.000.
Mitchell, Charles S.: *See*—
Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., 4,506,276, Cl. 346-140.00R.
Mitchell, Don E.: *See*—
Kersch, Dennis R.; and Mitchell, Don E., 4,506,108, Cl. 174-52.0FP.
Mitchell, Donald B.: *See*—
Turner, George S.; and Mitchell, Donald B., 4,505,449, Cl. 248-669.000.
Mitchell, Stephen W., to National Research Development Corporation. Valve timing mechanisms of internal combustion engines. 4,505,235, Cl. 123-90.170.
Mitsubishi Chemical Industries, Limited: *See*—
Niwa, Toshio; Himeno, Kiyoshi; and Yoshihara, Junji, 4,505,715, Cl. 8-639.000.
Oguri, Yasuo; Saito, Junji; and Kijima, Naoto, 4,505,866, Cl. 264-42.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Akamatsu, Masahiko, 4,506,319, Cl. 363-138.000.
Katagi, Takashi; Makino, Shigeru; Tanaka, Hirokazu; and Kobayashi, Yuji, 4,506,270, Cl. 343-914.000.
Ohno, Nobuo, 4,506,153, Cl. 250-227.000.
Okado, Hiroyuki; Kakizoe, Masahiro; Otsuka, Shigeharu; and Sako, Yuji, 4,506,243, Cl. 335-132.000.
Ono, Hideyo, 4,506,381, Cl. 381-94.000.
Takenobu, Shinya, 4,506,191, Cl. 315-14.000.
Tsuji, Shintaro, 4,505,360, Cl. 187-29.00R.
Mitsubishi Gas Chemical Co., Inc.: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikazu; Kawata, Toshikatsu; Kiboshi, Shinzi; and Shibata, Akiyoshi, 4,506,053, Cl. 524-405.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Danno, Yoshiaki; and Nakagami, Tatsuro, 4,506,338, Cl. 364-551.000.
Mitsubishi Kasei Kogyo Kabushiki Kaisha: *See*—
Ikeya, Nobushige, 4,505,657, Cl. 425-72.00R.
Mitsubishi Nuclear Fuel Co., Ltd.: *See*—
Hasegawa, Shin-ich; Takano, Eiji; and Sekine, Masao, 4,505,882, Cl. 423-261.000.
Mitsubishi Yuka Fine Chemicals Co., Ltd.: *See*—
Hokamura, Sadakazu; Shinohara, Toshio; Nomura, Ryoichi; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,505,954, Cl. 427-380.000.
Mitsuboshi Belting Ltd.: *See*—
Tomiyori, Takashi; Fukuda, Misao; Yamashita, Iwao; Simizu, Nobuo; and Kumano, Takeshi, 4,505,073, Cl. 51-165.00R.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Yashima, Nobuyoshi, 4,505,618, Cl. 405-211.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Tsuboi, Hikotada; Kawamata, Motoo; Oba, Masayuki; and Koga, Nobuhito, 4,506,042, Cl. 523-454.000.
Mitsuku Denshi Kogyo Kabushiki Kaisha: *See*—
Miyata, Muneyoshi, 4,506,122, Cl. 200-61.58R.
Mitsuo, Matsumoto: *See*—
Yoshiyuki, Sasaki; and Mitsuo, Matsumoto, 4,505,100, Cl. 57-207.000.
Mitsuya Seiko Co. Ltd.: *See*—
Yamada, Shinji; and Hanafusa, Saburo, 4,505,987, Cl. 428-553.000.
Mitutoyo Manufacturing Co., Ltd.: *See*—
Nishina, Shingo, 4,505,042, Cl. 33-172.00E.
Miwa, Hiromichi, to Nissan Motor Company, Limited. Electromagnetic injection control valve in unit fuel injector. 4,505,243, Cl. 123-446.000.
Miwa, Hiroshi; Kaneko, Toshio; Tonouchi, Akira; and Anan, Tatsuro, to Nippon Kokan Kabushiki Kaisha. Method for electroplating steel strip. 4,505,785, Cl. 204-28.000.
Miyake, Shinichi: *See*—
Ueba, Yoshinobu; and Miyake, Shinichi, 4,505,543, Cl. 350-96.340.
Miyaki, Masahiko: *See*—
Shinoda, Kazuo; Miyaki, Masahiko; Masuda, Akira; and Koide, Hiroshi, 4,505,240, Cl. 123-357.000.
Miyao, Toshimi: *See*—
Kubota, Isao; Kobayashi, Kunio; and Miyao, Toshimi, 4,506,000, Cl. 430-39.000.
Miyashita, Takao: *See*—
Umeda, Takao; Simazaki, Yuzuru; Igawa, Tatsuo; Tanno, Seikichi; Sasaki, Ken; and Miyashita, Takao, 4,505,546, Cl. 350-334.000.
Miyata, Muneyoshi, to Mitsuku Denshi Kogyo Kabushiki Kaisha. Selection switch. 4,506,122, Cl. 200-61.58R.
Miyata, Shigeo; Okada, Akira; and Hirose, Toru, to Kyowa Chemical Industry Co., Ltd. Fibrous magnesium oxide and process for production thereof. 4,505,887, Cl. 423-635.000.
Miyawaki, Junichi: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikazu; Kawata, Toshikatsu; Kiboshi, Shinzi; and Shibata, Akiyoshi, 4,506,053, Cl. 524-405.000.
Mizuhata, Teruo: *See*—
Isogai, Sakichi; Mizuhata, Teruo; Takahashi, Masaaki; Imai, Takayoshi; Nakanishi, Kazuyoshi; Ito, Takefumi; and Koshihara, Atsuo, 4,505,397, Cl. 212-232.000.
Mizuide, Yasuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Differential current distributing circuit. 4,506,170, Cl. 307-355.000.
Mizuno, Masataka; Ito, Tatsuo; Sugawara, Shuji; Moriyama, Masakazu; Muto, Masahito; and Nakane, Shuji, to Fujitsu Ten Limited. Antenna apparatus for vehicle-mounted receiver/transmitter equipment with automatic antenna length control. 4,506,266, Cl. 343-715.000.
Mizuno, Sueo; Mizutani, Katsushi; and Koumura, Masahiko, to Rinnai Kabushiki Kaisha. Water heater. 4,505,253, Cl. 126-351.000.
Mizutani, Katsushi: *See*—
Mizuno, Sueo; Mizutani, Katsushi; and Koumura, Masahiko, 4,505,253, Cl. 126-351.000.
Mizutani, Yoshihisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Metal-oxide-semiconductor device with bilayered source and drain. 4,506,279, Cl. 357-23.110.
Mobay Chemical Corporation: *See*—
Witman, Mark W.; and Reinert, Gerard E., 4,506,047, Cl. 524-89.000.

Mobil Oil Corporation: *See*—
Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., 4,506,106, Cl. 585-312.000.
Lu, Pang-Chia, 4,505,961, Cl. 428-35.000.
Lu, Pang-Chia, 4,505,962, Cl. 428-35.000.
Sidhwa, Feroze J., 4,506,263, Cl. 340-856.000.
Weiner, Milton L., 4,505,969, Cl. 428-213.000.

Mohacsi, Gabor: *See*—
Oszlar, Imre; Beck, Andras; and Mohacsi, Gabor, 4,506,130, Cl. 219-73.100.

Molins PLC: *See*—
Hinchcliffe, Dennis; and Wright, Anthony P., 4,505,091, Cl. 53-444.000.

Moller, Dieter: *See*—
Kramer, Erhardt; Moller, Dieter; and Brauer, Ralph, 4,505,311, Cl. 141-129.000.

Moller, Tilo: *See*—
Thevis, Paul; and Moller, Tilo, 4,505,336, Cl. 169-85.000.

Mollman, Walter G., to Rockwell International Corporation. Multiple position electrical switch. 4,506,118, Cl. 200-1.00R.

Monark-Crescent AB: *See*—
Kaufeldt, Roland, 4,505,315, Cl. 157-1.500.

Mondorf, Paul: *See*—
Dinis, Antonio; de la Fuente, Carlos; and Mondorf, Paul, 4,505,081, Cl. 52-223.00L.

Monerie, Michel; and Leclert, Alain. Process and apparatus for the coherent detection and demodulation of a phase-modulated carrier wave in a random polarization state. 4,506,388, Cl. 455-616.000.

Monsanto Company: *See*—
Franz, John E., 4,505,736, Cl. 71-76.000.
Leffingwell, James W., 4,505,960, Cl. 428-17.000.
Singh, Rajendra K., 4,505,735, Cl. 71-086.000.

Montgomery, Warren A., to AT&T Bell Laboratories. Time stamping for a packet switching system. 4,506,358, Cl. 370-60.000.

Moody, Arlin R.; and Moody, Bobby J. Combination clean-out and drilling tool. 4,505,341, Cl. 175-65.000.

Moody, Bobby J.: *See*—
Moody, Arlin R.; and Moody, Bobby J., 4,505,341, Cl. 175-65.000.

Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, to International Flavors & Fragrances, Inc. Methyl substituted pinyl oxopentenes, organoleptic uses thereof and process for preparing same. 4,506,104, Cl. 568-820.000.

Moore, Dennis G. Submersible signal lamp with interchangeable lens assembly. 4,506,314, Cl. 362-267.000.

Moore, Herbert; Santos, Stephen; and Wysong, Robert D., to Du Pont de Nemours, E. I., and Company. Tracer for circulation determinations. 4,505,888, Cl. 424-1.100.

Moore, Patrick D. Indoor greenhouse. 4,505,066, Cl. 47-17.000.

Moore, Robert M.: *See*—
Meisner, John W.; Moore, Robert M.; and Bienvenue, Louis L., 4,505,644, Cl. 417-50.000.

Moore, Thomas S.; and Pennington, Delmas B., to Rohm and Haas Company. Crack propagation resistant acrylic sheet. 4,505,972, Cl. 428-220.000.

Moorman, Charles J.: *See*—
Reuter, Frederick A.; and Moorman, Charles J., 4,506,159, Cl. 250-377.000.

Moreland, John F., Jr.: *See*—
Kingsley, William; Stoffel, James C.; Moreland, John F., Jr.; Matteson, Ronald G.; Wiggins, Douglas G.; and Allis, Robert F., 4,506,301, Cl. 358-280.000.

Morgenstern, Stanley W.: *See*—
Nix, Paul T.; Goldfarb, Rebecca D.; Stong, Linda J.; Sulick, Lorraine E.; Trivedi, Ramesh C.; and Morgenstern, Stanley W., 4,505,756, Cl. 127-29.000.

Mori, Toshihito; Yoshizaki, Hideo; and Hasegawa, Akio, to Asahi Kasei Kogyo Kabushiki Kaisha; and Kowa Co., Ltd. Purified plasminogen activator, process for its production and thrombolytic composition containing it. 4,505,893, Cl. 424-94.000.

Morita, Shigetoshi: *See*—
Furuichi, Shinji; Morita, Shigetoshi; Taka, Shunichi; and Suwabe, Hirohisa, 4,506,308, Cl. 360-121.000.

Moritoki, Masato: *See*—
Fukutsuka, Toshiro; Moritoki, Masato; Fujikawa, Takao; and Gennai, Norio, 4,505,762, Cl. 148-11.50R.

Moriyama, Masakazu: *See*—
Mizuno, Masataka; Ito, Tatsuo; Sugawara, Shuji; Moriyama, Masakazu; Muto, Masahito; and Nakane, Shuji, 4,506,266, Cl. 343-715.000.

Morley, Richard E., to Gould Inc. Systematic memory error detection and correction apparatus and method. 4,506,362, Cl. 371-13.000.

Morris, Earl L.; and Hafner, V. Walter, to Acorn Engineering Company. Vandal-resistant and tamper-proof plenum or vacuum chamber security air flow adjustment device. 4,505,189, Cl. 98-40.190.

Morris, James F., to United States of America, National Aeronautics and Space Administration. High thermal power density heat transfer apparatus providing electrical isolation at high temperature using heat pipes. 4,506,183, Cl. 310-306.000.

Morris, Nicholas G.; Kingsbury, Charles M.; and Beckwith, Bruce R., to Emhart Industries, Inc. Delivery drive for glassware forming machine. 4,505,731, Cl. 65-225.000.

Morris, Stanley. Advertising display apparatus. 4,505,059, Cl. 40-10.00D.

Morsucci, Juan C.: *See*—
Silvestrini, Jesus A.; and Morsucci, Juan C., 4,505,670, Cl. 432-124.000.

Mortimer, John H.: *See*—
Boehm, Paul C.; Mortimer, John H.; Rowan, Henry M.; and Turner, Robert C., 4,506,131, Cl. 219-10.770.

Moser, Winfried: *See*—
Damson, Eckart; Moser, Winfried; Muller, Klaus; Rieger, Franz; and Schubler, Rainer, 4,506,186, Cl. 313-129.000.

Mosher, Eugene L.: *See*—
Sandberg, Christopher T.; and Mosher, Eugene L., 4,505,601, Cl. 384-428.000.

Moss, Hans B. F., to AB Volvo, Torslanda. Power transmission chain. 4,505,693, Cl. 474-240.000.

Moss, Stephen F.: *See*—
Newsome, Peter M.; Moss, Stephen F.; Beeley, Lee J.; and Burgess, Malcolm N., 4,505,926, Cl. 514-398.000.

Mostek Corporation: *See*—
Proebsting, Robert J., 4,506,347, Cl. 365-51.000.

Motley, Jerry D.: *See*—
Regalbuto, John A.; Christopher, Glenn B.; and Motley, Jerry D., 4,505,018, Cl. 29-432.000.

Motorola, Inc.: *See*—
Cho, Frederick Y.; and Williams, Dylan F., 4,506,239, Cl. 333-196.000.
Little, Wendell L.; and Herold, Barry W., 4,506,167, Cl. 307-279.000.
Lucas, Alfred R., 4,506,384, Cl. 455-51.000.
Merrill, Perry L., 4,506,280, Cl. 357-36.000.
Newton, Anthony D.; and Perkins, Geoffrey W., 4,506,292, Cl. 358-34.000.

Motors & Armatures, Inc.: *See*—
Chernoff, Edward A.; Lindtveit, Kirby M.; and Levy, Paul, 4,506,179, Cl. 310-91.000.

Mougne, Marcel L., to Gearhart Industries, Inc. Earth formation porosity determination with dual epithermal neutron detector system. 4,506,156, Cl. 250-266.000.

MTU Motoren-Und Turbinen-Union Muenchen GmbH: *See*—
Groess, Helmut; and Graeml, Horst, deceased, 4,505,639, Cl. 416-97.00R.

Muchowski, Joseph M.; and Greenhouse, Robert, to Syntex (U.S.A.) Inc. 5-Benzoyl-1,2-dihydro-3H-pyrrolo[1,2-a]pyrrole-1-carboxylic acids and pharmaceutical use thereof. 4,505,927, Cl. 514-413.000.

Mueller, Leonard E., to Mueller, Leonard E.; and Brown, Carl R. Rolling vehicle. 4,505,346, Cl. 180-7.400.

Mueller, Warren B.; and Jones, Jesse D., to Ethyl Corporation. Thermoplastic PVC molding compositions containing a phosphite compound. 4,506,049, Cl. 524-139.000.

Muesch, Herbert: *See*—
Zeugner, Horst; Ruhland, Michael; Liepmann, Hans; Milkowski, Wolfgang; and Muesch, Herbert, 4,505,908, Cl. 514-221.000.

Muggli, Jurg; and Guttinger, Heinz, to Cerberus AG. Smoke detector with a radiation source operated in a pulse-like or intermittent mode. 4,506,161, Cl. 250-574.000.

Mukoyama, Yoshiyuki; Hirai, Osamu; and Aoyama, Tetsuya, to Hitachi Chemical Co., Ltd. Liquid chromatographic column packing material. 4,505,818, Cl. 210-502.100.

Mukoyama, Yoshiyuki: *See*—
Nishizawa, Hiroshi; Mukoyama, Yoshiyuki; Kasai, Shozo; and Okada, Yasunori, 4,505,980, Cl. 428-383.000.

Mulder, Douglas C., to Nordson Corporation. Apparatus for transferring powder from bulk drums. 4,505,623, Cl. 406-114.000.

Muller, Dieter: *See*—
Ziemek, Gerhard; Schatz, Friedrich; Muller, Dieter; and Rowell, Douglas W., 4,506,135, Cl. 219-107.000.

Muller, Joachim: *See*—
Wolf, Dieter; and Muller, Joachim, 4,505,598, Cl. 368-309.000.

Muller, Klaus: *See*—
Damson, Eckart; Moser, Winfried; Muller, Klaus; Rieger, Franz; and Schubler, Rainer, 4,506,186, Cl. 313-129.000.

Muller, Leo; Koder, Walter; Brandenstein, Manfred; Walter, Lothar; Edelmann, Ludwig; Bonengel, Roland; and Haas, Roland, to SKF Kugellagerfabriken GmbH. Clutch thrust bearing. 4,505,369, Cl. 192-98.000.

Muller, Werner, to Maschinenfabrik Ettlingen Friedrich Pfeiffer KG. Mechanism for centering reinforcing mesh. 4,505,658, Cl. 425-117.000.

Multifastener Corporation: *See*—
Smallegan, Jon M., 4,505,416, Cl. 227-120.000.

Multiform Desiccants, Inc.: *See*—
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,505,727, Cl. 55-387.000.

Multiphonie S.A.: *See*—
Fresard, Marcel, 4,506,117, Cl. 179-114.00R.

Mund, Konrad; Luft, Gunter; and Gebhardt, Ulrich, to Siemens Aktiengesellschaft. Method for urea analysis. 4,505,784, Cl. 204-1.00T.

Munih, Pavel, to SAVA KRANJ industrija gumijevih, usnjenih in kemicnih izdelkov n.o.sol.o. Method for the continuous processing of coarse-grained waste rubber into a secondary rubber raw material. 4,506,034, Cl. 521-41.000.

Munn, Laurie P. Motorcycle firearm carrier. 4,505,411, Cl. 224-39.000.

Munro, Joan C., to American Greetings Corporation. Form retaining stuffed figurine. 4,505,687, Cl. 446-368.000.

Murata Kikai Kabushiki Kaisha: *See*—
Baba, Susumu, 4,505,098, Cl. 57-22.000.
Fukunaga, Mitsuo; and Nagao, Isao, 4,505,099, Cl. 57-86.000.
Mima, Hiroshi, 4,505,097, Cl. 57-22.000.

Murphy, Bernard J., to Ingersoll-Rand Company. Steering means for, and in combination with, an articulated vehicle. 4,505,349, Cl. 180-136.000.
Murphy, Frank W., Jr.; Carlton, Lewis M.; O'Mary, Bob L.; and Cruse, Teddy H., to Frank W. Murphy Manufacturer, Inc. Pneumatically controlled dump valve system for gas scrubbers. 4,505,288, Cl. 137-59.000.
Murphy, Patrick J.: *See*—
Peterson, Brian P.; and Murphy, Patrick J., 4,506,121, Cl. 200-50.00B.
Murphy, William A.: *See*—
Coy, David H.; and Murphy, William A., 4,505,897, Cl. 514-11.000.
Murray, Francis E., to Wescam Services Inc. Composition and method for treating flue gas and methanol containing effluents. 4,505,776, Cl. 162-51.000.
Musha, Tohru: *See*—
Kato, Kiichi; Musha, Tohru; and Ito, Kenichi, 4,505,584, Cl. 356-123.000.
Musto, Joseph A.: *See*—
Jones, Gary V.; Meinhold, James F.; and Musto, Joseph A., 4,505,940, Cl. 426-424.000.
Muterel, Roland, to Societe Anonyme D.B.A. Braking system for automobile vehicle formed by a tractor and a trailer. 4,505,519, Cl. 303-6.00A.
Muto, Masahito: *See*—
Mizuno, Masataka; Ito, Tatsuo; Sugawara, Shuji; Moriyama, Masakazu; Muto, Masahito; and Nakane, Shuji, 4,506,266, Cl. 343-715.000.
Myerscough, Paul F.: *See*—
Wheeldon, John B.; Jeffery, John; and Myerscough, Paul F., 4,505,383, Cl. 198-853.000.
Naarden International N.V.: *See*—
Kaufhold, Manfred; and Takken, Hendrik J., 4,506,102, Cl. 568-667.000.
NACAM: *See*—
Haldric, Bernard, 4,505,608, Cl. 403-13.000.
Nadella: *See*—
Stephan, Gerard, 4,505,523, Cl. 384-445.000.
Nagai, Shigeru: *See*—
Endo, Yoichi; Nakanishi, Kazuo; Namura, Hideki; Doi, Terukazu; Kusumoto, Katsunori; Shimizu, Kazuyuki; Yoshimi, Kazuhiko; Nagai, Shigeru; and Sato, Shoichi, 4,505,217, Cl. 114-103.000.
Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Reference voltage producing circuit. 4,506,208, Cl. 323-314.000.
Nagano, Teruo: *See*—
Tamoto, Koji; Umehara, Akira; Nagano, Teruo; Iwasaki, Masayuki; and Aotani, Yoshimasa, 4,505,793, Cl. 204-159.160.
Nagao, Isao: *See*—
Fukunaga, Mitsuo; and Nagao, Isao, 4,505,099, Cl. 57-86.000.
Nagashima, Tsuneyasu; and Sato, Youji, to Kasai Kogyo Co., Ltd.; and Nifco Inc. Upholstery fixing device. 4,505,611, Cl. 403-406.000.
Nagata, Masayuki: *See*—
Onishi, Toshitada; Tateishi, Hiroshi; Koyama, Kenichi; Saito, Shigeo; and Nagata, Masayuki, 4,506,109, Cl. 174-128.00S.
Nagata, Yukiaki: *See*—
Sugino, Kenji; and Nagata, Yukiaki, 4,505,638, Cl. 415-113.000.
Nagel, Judy A.: *See*—
Bergamo, Robert L.; Foreman, Gordon T.; Gallaro, Anthony V.; and Nagel, Judy A., 4,505,999, Cl. 430-24.000.
Nagoya University: *See*—
Kaneko, Yasuyuki; Ito, Masao; Ogura, Yukio; and Ishikawa, Jiro, 4,505,821, Cl. 210-611.000.
Nagumo, Fumio, to Sony Corporation. Solid state camera. 4,506,294, Cl. 358-50.000.
Nagumo, Shuzo; Ogura, Setsuo; and Kitamura, Yukinori, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Method of fabricating a semiconductor device utilizing simultaneous outdiffusion and epitaxial deposition. 4,505,766, Cl. 148-175.000.
Nakagami, Tatsuro: *See*—
Danno, Yoshiaki; and Nakagami, Tatsuro, 4,506,338, Cl. 364-551.000.
Nakai, Tetsuo; and Yazu, Shuji, to Sumitomo Electric Industries, Ltd. Diamond for a tool and a process for the production of the same. 4,505,746, Cl. 75-243.000.
Nakai, Yoshiharu: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, 4,506,076, Cl. 548-119.000.
Nakajima, Junya; Itoh, Isamu; Yamamuro, Kiyohiko; and Ogawa, Eiiti, to Fuji Photo Film Co., Ltd. Method for processing color photographic materials. 4,506,007, Cl. 430-393.000.
Nakajima, Norio: *See*—
Sugiura, Susumu; Sato, Tadashi; and Nakajima, Norio, 4,505,576, Cl. 355-14.00R.
Nakajima, Toyohei; and Hosokawa, Takehiko, to Honda Giken Kogyo Kabushiki Kaisha; and Matsushita Electric Industrial Co., Ltd. Method for operating a closed loop air/fuel ratio control system of an internal combustion engine. 4,505,246, Cl. 123-489.000.
Nakamichi Corporation: *See*—
Kobayashi, Kazutoshi, 4,505,413, Cl. 226-108.000.
Nakamoto, Yasunobu: *See*—
Nameda, Naoyoshi; Surisawa, Yooji; Nakamoto, Yasunobu; and Sekiya, Hideshi, 4,505,263, Cl. 126-438.000.
Nakamura, Junnosuke: *See*—
Sugino, Yoshihide; Tsumura, Takashi; Nakamura, Junnosuke; and Yamaki, Kazuyoshi, 4,505,636, Cl. 414-736.000.
Nakamura, Kaoru, to Aisin Seiki Kabushiki Kaisha. Master cylinder. 4,505,112, Cl. 60-533.000.
Nakamura, Kazuo: *See*—
Chijiishi, Toshio; Matoba, Hiroshi; Nakamura, Kazuo; and Higuchi, Toshiaki, 4,505,659, Cl. 425-121.000.
Nakamura, Makoto, to Nissan Motor Company, Limited. Valve operating arrangement of an internal combustion engine. 4,505,236, Cl. 123-90.270.
Nakamura, Shigeru: *See*—
Sakaguchi, Shinji; Okamura, Hisashi; and Nakamura, Shigeru, 4,506,001, Cl. 430-213.000.
Nakamura, Yukihiro: *See*—
Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,505,739, Cl. 71-92.000.
Nakane, Shuji: *See*—
Mizuno, Masataka; Ito, Tatsuo; Sugawara, Shuji; Moriyama, Masakazu; Muto, Masahito; and Nakane, Shuji, 4,506,266, Cl. 343-715.000.
Nakanishi, Kazuo: *See*—
Endo, Yoichi; Nakanishi, Kazuo; Namura, Hideki; Doi, Terukazu; Kusumoto, Katsunori; Shimizu, Kazuyuki; Yoshimi, Kazuhiko; Nagai, Shigeru; and Sato, Shoichi, 4,505,217, Cl. 114-103.000.
Nakanishi, Kazuyoshi: *See*—
Isogai, Sakichi; Mizuhata, Teruo; Takahashi, Masaaki; Imai, Takayoshi; Nakanishi, Kazuyoshi; Ito, Takefumi; and Koshihara, Atsuo, 4,505,397, Cl. 212-232.000.
Nakanishi, Kiyoshi: *See*—
Kanda, Mutsumi; Matsushita, Souichi; Nakanishi, Kiyoshi; and Inoue, Tokuta, 4,505,233, Cl. 123-41.350.
Nakano, Kenji: *See*—
Tajima, Shigeru; Okada, Hiroshi; and Nakano, Kenji, 4,506,202, Cl. 318-603.000.
Nakayama, Shozo; and Watanabe, Hiroo, to Kabushiki Kaisha Morita Seisakusho. Driving method and device for dental hand-piece. 4,505,677, Cl. 433-132.000.
Nakayashiki, Susumu; Kida, Masahiko; and Hashimoto, Toyokazu, to Hitachi, Ltd. Method and apparatus for switching loop type transmission lines. 4,506,357, Cl. 370-16.000.
Nakazawa, Tetsuo: *See*—
Tanigawa, Takatoshi; Yaegashi, Sakari; Nakazawa, Tetsuo; Hatazi, Masahiko; and Nango, Tadao, 4,506,041, Cl. 523-139.000.
Nameda, Naoyoshi; Surisawa, Yooji; Nakamoto, Yasunobu; and Sekiya, Hideshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Heat collector. 4,505,263, Cl. 126-438.000.
Namura, Hideki: *See*—
Endo, Yoichi; Nakanishi, Kazuo; Namura, Hideki; Doi, Terukazu; Kusumoto, Katsunori; Shimizu, Kazuyuki; Yoshimi, Kazuhiko; Nagai, Shigeru; and Sato, Shoichi, 4,505,217, Cl. 114-103.000.
Nango, Tadao: *See*—
Tanigawa, Takatoshi; Yaegashi, Sakari; Nakazawa, Tetsuo; Hatazi, Masahiko; and Nango, Tadao, 4,506,041, Cl. 523-139.000.
Naruo, Noboru; and Kawanishi, Hidekata, to Matsushita Electric Industrial Co., Ltd. Sheathed resistance heater. 4,506,251, Cl. 338-238.000.
Narusz, Nobutaka: *See*—
Hibino, Takashi; Naruse, Nobutaka; and Yoshida, Kazuhiro, 4,505,130, Cl. 62-347.000.
NATEC Institut: *See*—
Seidel, Hartmut; and Hammerschmidt, Winrich B., 4,505,660, Cl. 425-129.00S.
Nathan, Walter, to RTC Industries, Inc. Magazine display tray. 4,505,395, Cl. 211-126.000.
National Research Development Corporation: *See*—
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,506,222, Cl. 324-309.000.
Miller, Donald S.; and King, Roger, 4,505,617, Cl. 405-211.000.
Mitchell, Stephen W., 4,505,235, Cl. 123-90.170.
National Semiconductor Corporation: *See*—
Husain, Syed, 4,505,225, Cl. 118-669.000.
Ross, John P.; and Bernardi, Carl E., 4,505,015, Cl. 29-116.00R.
National Starch and Chemical Corporation: *See*—
Schoenberg, Jules E.; and Anderson, Stephen P., 4,506,100, Cl. 564-430.000.
Nattermann & Cie GmbH: *See*—
Biedermann, Jurgen; Etschenberg, Eugen; Friehe, Hugo; Scheef, Wolfgang; and Winkelmann, Johannes, 4,505,854, Cl. 260-112.50R.
Navato, Jose R. Automatic parenteral infusion apparatus. 4,505,701, Cl. 604-143.000.
Naviasky, Eric H.: *See*—
Evans, William P.; McCabe, Robert J.; and Naviasky, Eric H., 4,506,171, Cl. 307-362.000.
NCR Canada Ltd. - NCR Canada LTEE: *See*—
Gupta, Bal K., 4,506,152, Cl. 250-216.000.
NCR Corporation: *See*—
Collins, Donald A., 4,506,365, Cl. 371-38.000.
Lawter, Raymond L., 4,506,261, Cl. 340-718.000.
NEC Corporation: *See*—
Ichikawa, Yoshio; and Ohyagi, Takashi, 4,506,386, Cl. 455-343.000.
Nechvatal, Van A.: *See*—
Price, Donald L.; and Nechvatal, Van A., 4,505,063, Cl. 43-17.000.
Nedelcheva, Aneliya A.: *See*—
Koev, Koycho G.; Nedelcheva, Aneliya A.; Todorova, Yasmina S.; and Uzunova, Iglika T., 4,505,432, Cl. 241-29.000.

Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek: *See*—
Gut, Jiri; and van Oosten, Adriaan M., 4,505,934, Cl. 514-762.000.

Neet, Thomas E.; and Spieker, David A., to United States of America, Energy. Electrically conductive rigid polyurethane foam. 4,505,973, Cl. 428-317.900.

Neidig, Arno; Berndt, Dietmar; Wahl, Georg; and Wittmer, Mark, to Brown, Boveri & Cie AG. Method of direct bonding copper foils to oxide-ceramic substrates. 4,505,418, Cl. 228-122.000.

Neil, Iain A., to Barr & Stroud Limited. Infrared objective lens systems. 4,505,535, Cl. 350-1.300.

Nelson, Steve; Reynolds, Frank; Roos, George E.; and Ball, John, to Walker Limited Partnership. Line throwing device. 4,505,179, Cl. 89-1.00G.

Nelson, Thomas L., to Du Pont de Nemours, E. I., and Company. Process and apparatus for making coherent yarn. 4,505,013, Cl. 28-274.000.

Neppl, Franz: *See*—
Schwabe, Ulrich; Neppl, Franz; Burker, Ulf; and Christoph, Werner, 4,505,027, Cl. 29-577.00C.

Ness, Ronald J., to Garrett Corporation, The. No-back gas generator and method. 4,505,105, Cl. 60-200.100.

Nestec S. A.: *See*—
Bertholet, Raymond; and Hirsbrunner, Pierre, 4,506,080, Cl. 548-504.000.

Nestell, David E.: *See*—
Clark, Russell L.; and Nestell, David E., 4,505,054, Cl. 33-357.000.

Neuburger, Werner; and Gabor, Martin P., to Datapic Systems, Inc. Graphic display. 4,505,061, Cl. 40-489.000.

Neuffer, Kurt: *See*—
Rothley, Manfred; Zabler, Erich; Neuffer, Kurt; and Reinhart, Karl-Franz, 4,506,217, Cl. 324-208.000.

Neves, Fernando B.: *See*—
Albers, Francis G.; and Neves, Fernando B., 4,505,558, Cl. 354-4.000.

New York Blood Center, Inc.: *See*—
Blomback, Birger; and Okada, Masahisa, 4,505,817, Cl. 210-484.000.
Blomback, Birger; and Okada, Masahisa, 4,505,822, Cl. 210-635.000.

Newsome, Peter M.; Moss, Stephen F.; Beeley, Lee J.; and Burgess, Malcolm N., to Beecham Group p.l.c. Quaternary amino imidazolidines, compositions and use. 4,505,926, Cl. 514-398.000.

Newton, Anthony D.; and Perkins, Geoffrey W., to Motorola, Inc. Video driver circuit and method for automatic gray scale adjustment and elimination of contrast tracking errors. 4,506,292, Cl. 358-34.000.

NGK Insulators, Ltd.: *See*—
Mase, Syunzo; and Soejima, Shigeo, 4,505,783, Cl. 204-1.00T.
Mase, Syunzo; and Soejima, Shigeo, 4,505,790, Cl. 204-130.000.
Mase, Syunzo; and Soejima, Shigeo, 4,505,802, Cl. 204-425.000.
Mase, Syunzo; and Soejima, Shigeo, 4,505,803, Cl. 204-425.000.
Mase, Syunzo; and Soejima, Shigeo, 4,505,804, Cl. 204-425.000.
Mase, Syunzo; and Soejima, Shigeo, 4,505,805, Cl. 204-425.000.

NGK Spark Plug Co., Ltd.: *See*—
Yamada, Tetsuyo, 4,50.,806, Cl. 204-425.000.
Yamada, Tetsuyo, 4,505,807, Cl. 204-425.000.

Ngo, That T.: *See*—
Lenhoff, Howard M.; and Ngo, That T., 4,506,009, Cl. 435-7.000.

Nguyen, Hai N., to 118343 Canada Inc. Solar collector and arrangements thereof. 4,505,257, Cl. 126-432.000.

Nguyen-Thanh, Thong, to Commissariat a l'Energie Atomique; and Stein Industrie. Heat exchanger. 4,505,329, Cl. 165-81.000.

Nichiban Co., Ltd.: *See*—
Ito, Toshio, 4,505,891, Cl. 424-28.000.

Nicolaisen, Holger, to Danfoss A/S. Apparatus for clamping electric conductors, particularly wires. 4,505,533, Cl. 339-198.00R.

Nicolaus, Frank G., to Bally Manufacturing Corporation. Floating pawl structure providing compound angular yieldability. 4,505,167, Cl. 74-577.00R.

Niedersachsischer Minister fur Ernahrung, Landwirtschaft und Forsten: *See*—
Niemeyer, Hans, 4,505,065, Cl. 43-107.000.

Niemeyer, Hans, to Niedersachsischer Minister fur Ernahrung, Landwirtschaft und Forsten. Insect trap. 4,505,065, Cl. 43-107.000.

Nierga, Manuel R., to Spica S.p.A. Systems for varying the advance of an injection pump, particularly of the distributor type. 4,505,247, Cl. 123-500.000.

Nifco Inc.: *See*—
Nagashima, Tsuneyasu; and Sato, Youji, 4,505,611, Cl. 403-406.000.

Nightengale, Thomas E. Spherical star chart with indicator. 4,505,680, Cl. 434-289.000.

Nihei, Tetsuo: *See*—
Sakuma, Kazuyoshi; Nihei, Tetsuo; and Maki, Toshio, 4,505,144, Cl. 72-345.000.

Nii, Donald S.: *See*—
Kelly, Lawrence S.; Schaffran, Dean L.; and Nii, Donald S., 4,505,405, Cl. 222-135.000.

Niinobe, Takao: *See*—
Yoshida, Kokichi; Niinobe, Takao; and Baba, Takashi, 4,505,788, Cl. 204-74.000.

Nikkel, Willem A.: *See*—
DeLigt, John; and Nikkel, Willem A., 4,505,090, Cl. 53-137.000.

Nilssen, Ole K. Inverter with controllable RMS output voltage magnitude. 4,506,318, Cl. 363-132.000.

Nilsson, Jan: *See*—
Adlerborn, Jan; Larker, Hans; and Nilsson, Jan, 4,505,871, Cl. 264-325.000.

Nippon Electric Co., Ltd.: *See*—
Kashigi, Kazuo, 4,506,286, Cl. 358-13.000.
Shimidzu, Yasutaka; Kenmochi, Hirohito; Ueno, Toshihiko; and Tani, Chizuka, 4,505,549, Cl. 350-349.000.
Sone, Junichi, 4,506,166, Cl. 307-277.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Ito, Toshio, 4,505,891, Cl. 424-28.000.

Nippon Kogaku K.K.: *See*—
Hada, Kazunari; Fujii, Norio; Kawahara, Atsushi; Azuma, Toru; and Hazama, Junji, 4,506,382, Cl. 382-27.000.
Hashimoto, Takaaki, 4,506,290, Cl. 358-29.000.
Ogasawara, Akira, 4,506,150, Cl. 250-204.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Endo, Yoichi; Nakanishi, Kazuo; Namura, Hideki; Doi, Terukazu; Kusumoto, Katsunori; Shimizu, Kazuyuki; Yoshimi, Kazuhiko; Nagai, Shigeru; and Sato, Shoichi, 4,505,217, Cl. 114-103.000.
Miwa, Hiroshi; Kaneko, Toshio; Tonouchi, Akira; and Anan, Tatsuro, 4,505,785, Cl. 204-28.000.

Nippon Petrochemical Company, Limited: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,506,107, Cl. 174-25.00C.

Nippon Piston Ring Co., Ltd.: *See*—
Hirakawa, Osamu, 4,505,485, Cl. 277-96.100.

Nippon Seiko Kabushiki Kaisha: *See*—
Ohkuma, Takeo; and Tanaka, Akihiko, 4,505,484, Cl. 277-94.000.

Nippon Soken, Inc.: *See*—
Takeuchi, Yukihisa; and Tomita, Masahiro, 4,505,726, Cl. 55-282.000.

Nippon Steel Corporation: *See*—
Ichikawa, Masashi; Saito, Toru; and Nishi, Takeshi, 4,506,134, Cl. 219-100.000.

Nippon Thomson Co., Ltd.: *See*—
Tanaka, Kazuhiko, 4,505,522, Cl. 308-6.00C.

Nippondenso Co., Ltd.: *See*—
Shinoda, Kazuo; Miyaki, Masahiko; Masuda, Akira; and Koide, Hiroshi, 4,505,240, Cl. 123-357.000.
Takeuchi, Yukihisa; and Tomita, Masahiro, 4,505,726, Cl. 55-282.000.
Yamaguchi, Shunzo; Fukazawa, Takeshi; and Atsumi, Morihiro, 4,505,107, Cl. 60-303.000.

Nishi, Takeshi: *See*—
Ichikawa, Masashi; Saito, Toru; and Nishi, Takeshi, 4,506,134, Cl. 219-100.000.

Nishibori, Sadao. Method for manufacturing wood-like molded product. 4,505,869, Cl. 264-115.000.

Nishikawa, Masao; and Aoki, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Automatic braking system for vehicles. 4,505,351, Cl. 180-169.000.

Nishina, Shingo, to Mitutoyo Manufacturing Co., Ltd. Dimension measuring instrument. 4,505,042, Cl. 33-172.00E.

Nishino, Taizou: *See*—
Yamanaka, Junichi; and Nishino, Taizou, 4,506,287, Cl. 358-21.00R.

Nishio, Etsuro; and Okura, Zenichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Rotation control mechanism for diaphram-operating ring in interchangeable objective for photographic camera. 4,505,564, Cl. 354-270.000.

Nishizawa, Hiroshi; Mukoyama, Yoshiyuki; Kasai, Shozo; and Okada, Yasunori, to Hitachi Chemical Co., Ltd. Insulated wire. 4,505,980, Cl. 428-383.000.

Nishizawa, Jun-ichi; and Ohmi, Tadahiro, to Semiconductor Research Foundation. GaAs semiconductor device. 4,506,281, Cl. 357-43.000.

Nishizawa, Tetuo: *See*—
Hara, Hiroshi; Tobioka, Takashi; Nishizawa, Tetuo; and Yoshino, Takeshi, 4,505,562, Cl. 354-203.000.

Nissan Motor Company, Limited: *See*—
Kakimoto, Toshihiko, 4,505,461, Cl. 267-140.100.
Kishi, Norimasa; Noso, Kazunori; and Futami, Toru, 4,506,377, Cl. 381-41.000.
Matsui, Shinichi, 4,506,380, Cl. 381-71.000.
Miwa, Hiromichi, 4,505,243, Cl. 123-446.000.
Nakamura, Makoto, 4,505,236, Cl. 123-90.270.
Noso, Kazunori; Kishi, Norimasa; Futami, Toru; Nomura, Hiroyuki; and Shiraishi, Yasuhiro, 4,506,378, Cl. 381-43.000.
Okamoto, Masaya; and Terada, Shigeru, 4,505,111, Cl. 60-431.000.
Suzuki, Takashi; Yamagata, Syuzi; and Osako, Jyunji, 4,505,354, Cl. 180-297.000.
Utsumi, Shunji; and Chikaraishi, Takayo, 4,505,500, Cl. 292-48.000.
Yasuhara, Seishi, 4,506,337, Cl. 364-550.000.
Yuzawa, Haruo; and Sunamura, Kazuhiro, 4,505,248, Cl. 123-519.000.

Nisshin Steel Co., Ltd.: *See*—
Itoh, Masahiko; Midorikawa, Heihatiro; Minato, Akira; Kubo, Mituru; Ito, Takehiko; and Katayama, Kiichiro, 4,505,760, Cl. 148-6.15R.

Nittan Company, Limited: *See*—
Sasaki, Isao, 4,506,255, Cl. 340-514.000.
Suzuki, Takashi; Kimura, Tetsuo; and Tanaka, Seiichi, 4,505,600, Cl. 374-170.000.

Niwa, Toshio; Himeno, Kiyoshi; and Yoshihara, Junji, to Mitsubishi Chemical Industries, Limited. Monoazo dyestuff mixtures to dye polyester yellow. 4,505,715, Cl. 8-639.000.

Nix, Paul T.; Goldfarb, Rebecca D.; Stong, Linda J.; Sulick, Lorraine E.; Trivedi, Ramesh C.; and Morgenstern, Stanley W., to CooperBiomedical, Inc. Alpha-amylase assay and substrates for use therein. 4,505,756, Cl. 127-29.000.

Nixon, Eugene H., Jr.: *See—*
Hoh, Thomas G.; Friedman, Bernard L.; Borchert, Wendall; and Nixon, Eugene H., Jr., 4,505,162, Cl. 74-41.000.

NL Industries, Inc.: *See—*
Barr, John D.; and Fuller, John M., 4,505,342, Cl. 175-329.000.
Cody, Charles A.; Reichert, William W.; Kemnetz, Steven J.; and Magauran, Edward D., 4,505,886, Cl. 423-616.000.

Nobis, Dieter: *See—*
Beerens, Hugo; Feldmann, Hugo; Gipperich, Theodor; Kirchhoff, Hans; Kusel, Siegfried; Schlanzke, Claus G.; and Nobis, Dieter, 4,505,374, Cl. 198-448.000.

Noguchi, Michihiro, to Konishiroku Photo Industry Co., Ltd. Range focusing system for a camera. 4,505,566, Cl. 354-400.000.

Noguchi, Tadashi, to Pioneer Electronic Corporation. Subcarrier signal generator for use in stereo tuners. 4,506,376, Cl. 381-4.000.

Nolan, James D. Methods of and apparatus for coating the glass envelope and predetermined portions of the end caps of a fluorescent lamp. 4,506,189, Cl. 313-493.000.

Nomura, Hiroyuki: *See—*
Noso, Kazunori; Kishi, Norimasa; Futami, Toru; Nomura, Hiroyuki; and Shiraishi, Yasuhiro, 4,506,378, Cl. 381-43.000.

Nomura, Ryoichi: *See—*
Hokamura, Sadakazu; Shinohara, Toshio; Nomura, Ryoichi; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,505,954, Cl. 427-380.000.

Nomura, Yoshiyuki: *See—*
Katsube, Hideo; Gamo, Gotaro; Kinoshita, Mitsuo; and Nomura, Yoshiyuki, 4,506,129, Cl. 219-69.00W.

Nonaka, Kei, to Kabushiki Kaisha Daini Seikosha. Electronic clinical thermometer. 4,505,599, Cl. 374-163.000.

Noon, Robert A.: *See—*
Kay, Ian T.; and Noon, Robert A., 4,506,084, Cl. 549-74.000.

Norden, Jurgen: *See—*
Aigner, Heinrich; Merget, Norbert; Norden, Jurgen; Schweppe, Manfred; and Wetter, Klaus, 4,505,732, Cl. 71-11.000.

Norden Laboratories, Inc.: *See—*
Kucera, Carrell J., 4,506,017, Cl. 435-253.000.

Nordson Corporation: *See—*
Cobbs, Walter H., Jr.; and Rehman, William R., 4,505,406, Cl. 222-135.000.
Cobbs, Walter H., Jr.; and Rehman, William R., 4,505,957, Cl. 427-422.000.
Mulder, Douglas C., 4,505,623, Cl. 406-114.000.

Norman, Robert W., Jr.: *See—*
Boothroyd, Donald C.; and Norman, Robert W., Jr., 4,506,345, Cl. 364-900.000.

North American Philips Consumer Electronics Corp.: *See—*
Bergamo, Robert L.; Foreman, Gordon T.; Gallaro, Anthony V.; and Nagel, Judy A., 4,505,999, Cl. 430-24.000.
Puhak, Peter G., 4,506,188, Cl. 313-405.000.

North American Philips Lighting Corporation: *See—*
Elms, Robert T., 4,506,195, Cl. 315-205.000.

North, Bernard F.: *See—*
Floyd, William C.; and North, Bernard F., 4,505,712, Cl. 8-186.000.

North Coast Systems, Inc.: *See—*
Millis, Donald E.; and Grys, Rodger J., 4,505,643, Cl. 417-12.000.

North, Howard L., Jr., to Becton, Dickinson and Company. Blood diluent. 4,506,018, Cl. 436-10.000.

Northern Industrial Sales & Service, Inc.: *See—*
Quenzi, Phil, 4,505,632, Cl. 414-510.000.

Northern Telecom Limited: *See—*
Entwistle, Stanley D., 4,505,159, Cl. 73-847.000.

Northwest Alaskan Pipeline Company: *See—*
Hazen, Craig B., 4,505,326, Cl. 165-45.000.

Norwalk Wastewater Equipment Company: *See—*
Graves, Jan D., 4,505,813, Cl. 210-86.000.

Noso, Kazunori; Kishi, Norimasa; Futami, Toru; Nomura, Hiroyuki; and Shiraishi, Yasuhiro, to Nissan Motor Company, Limited. Spoken-instruction controlled system for an automotive vehicle. 4,506,378, Cl. 381-43.000.

Noso, Kazunori: *See—*
Kishi, Norimasa; Noso, Kazunori; and Futami, Toru, 4,506,377, Cl. 381-41.000.

Notthoff, Johannes K.: *See—*
Zuleeg, Rainer; and Notthoff, Johannes K., 4,505,582, Cl. 356-5.000.

Nouvertne, Werner: *See—*
Medem, Harald; Schreckenberg, Manfred; Dhein, Rolf; Nouvertne, Werner; and Rudolph, Hans, 4,506,066, Cl. 528-196.000.

Nowell, John R.: *See—*
Genuit, Luther L.; and Nowell, John R., 4,506,256, Cl. 340-518.000.

Nuclear & Environmental Protection, Inc.: *See—*
Fink, Carl M.; and Holman, Edward C., 4,505,190, Cl. 98-115.100.

Nunokawa, Makoto: *See—*
Furusawa, Kahei; Nunokawa, Makoto; Ejiri, Yoshihiro; Yamamoto, Hitoshi; Yamazaki, Yoshihiko; and Tatekura, Koichi, 4,505,540, Cl. 350-96.200.

Nuova Faema S.p.A.: *See—*
Longo, Walter G., 4,505,191, Cl. 99-300.000.

Nusonics, Inc.: *See—*
Zacharias, Ellis M., Jr., 4,505,160, Cl. 73-861.180.

O. F. Mossberg & Sons, Inc.: *See—*
Grehl, William H., 4,505,183, Cl. 89-191.010.

Oba, Masayuki: *See—*
Tsuboi, Hikotada; Kawamata, Motoo; Oba, Masayuki; and Koga, Nobuhito, 4,506,042, Cl. 523-454.000.

O'Brien, Joseph P.: *See—*
Papay, Andrew G.; and O'Brien, Joseph P., 4,505,834, Cl. 252-51.50A.

Occidental Research Corporation: *See—*
Chemtob, Elie M.; and Beer, Gary L., 4,505,884, Cl. 423-484.000.

Ochiai, Masahiko; and Taito, Yoshinori, to Kyushu Hitachi Maxell, Ltd. Electric shaver arranged to be tilted. 4,505,036, Cl. 30-34.100.

O'Connor, Bruce, to Sym-Tek Systems, Inc. Electronic device handler. 4,506,213, Cl. 324-73.0AT.

Ogasawara, Akira, to Nippon Kogaku K.K. Automatic focus adjusting device with a brightness dependent lens drive signal. 4,506,150, Cl. 250-204.000.

Ogasawara, Nobuhiko: *See—*
Shizuka, Masayuki; Ogasawara, Nobuhiko; Kanamaru, Hisanobu; and Tsuruoka, Kazuhiro, 4,506,180, Cl. 310-91.000.

Ogawa, Eiiti: *See—*
Nakajima, Junya; Itoh, Isamu; Yamamuro, Kiyohiko; and Ogawa, Eiiti, 4,506,007, Cl. 430-393.000.

Ogawa, Yoshinari; Sakai, Kouichi; and Akagi, Noriyuki, to Teijin Limited. Glass fiber-reinforced thermoplastic polyester composition. 4,506,043, Cl. 523-523.000.

Ogiwara, Osao, to Akebono Brake Industry Co., Ltd. Semi-metallic friction pad subjected to rust preventive treatment. 4,505,963, Cl. 428-74.000.

Ogura, Seiki: *See—*
Scheuerlein, Roy E.; and Ogura, Seiki, 4,506,351, Cl. 365-205.000.

Ogura, Setsuo: *See—*
Nagumo, Shuzo; Ogura, Setsuo; and Kitamura, Yukinori, 4,505,766, Cl. 148-175.000.

Ogura, Yukio: *See—*
Kaneko, Yasuyuki; Ito, Masao; Ogura, Yukio; and Ishikawa, Jiro, 4,505,821, Cl. 210-611.000.

Oguri, Yasuo; Saito, Junji; and Kijima, Naoto, to Mitsubishi Chemical Industries, Limited. Process for producing a boehmite shaped product and a burned boehmite shaped product. 4,505,866, Cl. 264-42.000.

Ohi Seisakusho Co., Ltd.: *See—*
Utsumi, Shunji; and Chikaraishi, Takayo, 4,505,500, Cl. 292-48.000.

Ohkuma, Takeo; and Tanaka, Akihiko, to Nippon Seiko Kabushiki Kaisha. Sealing device for a rolling bearing. 4,505,484, Cl. 277-94.000.

Ohmi, Sigeru: *See—*
Fukuda, Hiroyuki; Kaji, Hisatsugu; Fujimaki, Hiroto; Yamanobe, Yoichiro; Hiruta, Masaru; and Ohmi, Sigeru, 4,506,028, Cl. 502-101.000.

Ohmi, Tadahiro: *See—*
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,506,281, Cl. 357-43.000.

Ohno, Nobuo, to Mitsubishi Denki Kabushiki Kaisha. Process signal collecting apparatus. 4,506,153, Cl. 250-227.000.

Ohshima, Ken: *See—*
Yoshikawa, Shoji; Ohshima, Ken; Kodama, Hiroshi; Yamamiya, Kunio; Sakamoto, Masaharu; and Kato, Kiichi, 4,505,585, Cl. 356-237.000.

Ohyagi, Takashi: *See—*
Ichikawa, Yoshio; and Ohyagi, Takashi, 4,506,386, Cl. 455-343.000.

Oikawa, Tadahisa: *See—*
Sato, Yo; Kashiwaba, Tadao; Matsuda, Yasuhiko; and Oikawa, Tadahisa, 4,505,773, Cl. 156-384.000.

Oil States Industries, Inc.: *See—*
Doner, August K.; Brady, Lewis L.; and Alvarado, Jesse T., 4,505,334, Cl. 166-284.000.

Oiles Industry Co., Ltd.: *See—*
Yamada, Shinji; and Hanafusa, Saburo, 4,505,987, Cl. 428-553.000.

Okada, Akira: *See—*
Miyata, Shigeo; Okada, Akira; and Hirose, Toru, 4,505,887, Cl. 423-635.000.

Okada, Hiroshi: *See—*
Tajima, Shigeru; Okada, Hiroshi; and Nakano, Kenji, 4,506,202, Cl. 318-603.000.

Okada, Masahisa: *See—*
Blomback, Birger; and Okada, Masahisa, 4,505,817, Cl. 210-484.000.
Blomback, Birger; and Okada, Masahisa, 4,505,822, Cl. 210-635.000.

Okada, Yasunori: *See—*
Nishizawa, Hiroshi; Mukoyama, Yoshiyuki; Kasai, Shozo; and Okada, Yasunori, 4,505,980, Cl. 428-383.000.

Okada, Yukio; and Iwamura, Akira, to Kawasaki Jukogyo Kabushiki Kaisha. Railway truck spring height adjustment device. 4,505,457, Cl. 267-3.000.

Okado, Hiroyuki; Kakizoe, Masahiro; Otsuka, Shigeharu; and Sako, Yuji, to Mitsubishi Denki Kabushiki Kaisha. Electromagnetic contactor. 4,506,243, Cl. 335-132.000.

Okamoto, Masaya; and Terada, Shigeru, to Nissan Motor Company, Limited. Hydraulic control system for industrial vehicle. 4,505,111, Cl. 60-431.000.

Okamura, Hisashi: *See—*
Sakaguchi, Shinji; Okamura, Hisashi; and Nakamura, Shigeru, 4,506,001, Cl. 430-213.000.
Takaki, Hideki; Hayashi, Hiroshi; Ono, Shigetoshi; and Okamura, Hisashi, 4,506,002, Cl. 430-215.000.

Okano, Takashi, to Pioneer Video Corporation. Time axis correction device for a signal reproduced from a recording medium. 4,506,313, Cl. 358-320.000.

Okuhara, Akira: *See—*
Togawa, Hideo; Takezawa, Taihei; Watanabe, Masazumi; Hayashi, Kazuya; and Okuhara, Akira, 4,505,938, Cl. 426-46.000.

Okuma Machinery Works Ltd.: *See—*
Kinoshita, Mikio, 4,505,020, Cl. 29-568.000.

Okumura, Takeshi: *See*—
Kusakabe, Hiroyoshi; Ishiko, Hideo; Okumura, Takeshi; Izumi, Masashi; and Furukawa, Masahiro, 4,505,123, Cl. 62-148.000.
Okura, Zenichi: *See*—
Nishio, Etsuro; and Okura, Zenichi, 4,505,564, Cl. 354-270.000.
Okushita, Masataka, to Dai Nippon Insatsu Kabushiki Kaisha. Apparatus for fabricating a bag-in-box package. 4,505,694, Cl. 493-101.000.
Olin Corporation: *See*—
Ford, James M., 4,505,789, Cl. 204-128.000.
Raes, Maurice C.; and Proulx, Oliver J., 4,506,040, Cl. 521-137.000.
Oliver, Janet L.: *See*—
Oliver, Wayne H.; and Oliver, Janet L., 4,505,085, Cl. 52-582.000.
Oliver, Wayne H.; and Oliver, Janet L. Split panel assembly. 4,505,085, Cl. 52-582.000.
Olofinsky, Evgeny P.: *See*—
Bragin, Boris F.; Korotkikh, Jury B.; Markuntovich, Felix D.; and Olofinsky, Evgeny P., 4,505,452, Cl. 251-326.000.
Olschansky, Brad; and Olschansky, Scott. Exercise system. 4,505,475, Cl. 272-118.000.
Olschansky, Scott: *See*—
Olschansky, Brad; and Olschansky, Scott, 4,505,475, Cl. 272-118.000.
Olympus Optical Co., Ltd.: *See*—
Asoma, Yoshito, 4,505,553, Cl. 350-414.000.
Kato, Kiichi; Musha, Tohru; and Ito, Kenichi, 4,505,584, Cl. 356-123.000.
Yoshikawa, Shoji; Ohshima, Ken; Kodama, Hiroshi; Yamamiya, Kunio; Sakamoto, Masaharu; and Kato, Kiichi, 4,505,585, Cl. 356-237.000.
O'Mara, William C. Method for making a conductive silicon substrate by heat treatment of oxygenated and lightly doped silicon single crystals. 4,505,759, Cl. 148-1.500.
O'Mary, Bob L.: *See*—
Murphy, Frank W., Jr.; Carlton, Lewis M.; O'Mary, Bob L.; and Cruse, Teddy H., 4,505,288, Cl. 137-59.000.
Omura, Takashi; Takahashi, Mikoto; Harada, Naoki; and Takeshita, Akira, to Sumitomo Chemical Company, Limited. Phthalocyanine fiber reactive compound. 4,505,714, Cl. 8-549.000.
Onahama Sakai Kagaku Kabushiki Kaisha: *See*—
Shinozuka, Kiyoshi; Otu, Koichi; and Fukumoto, Hiroshi, 4,505,755, Cl. 106-308.00B.
Ono, Takanori; and Saito, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Swing type power unit for a two-wheeled motor vehicle. 4,505,352, Cl. 180-219.000.
Onishi, Toshitada; Tateishi, Hiroshi; Koyama, Kenichi; Saito, Shigeo; and Nagata, Masayuki, to Agency of Ind. Science and Technology; and Sumitomo Electric. Al-stabilized superconducting wire and the method for producing the same. 4,506,109, Cl. 174-128.00S.
Ono, Hideyo, to Mitsubishi Denki Kabushiki Kaisha. Aural transmitter device. 4,506,381, Cl. 381-94.000.
Ono, Shigetoshi: *See*—
Takaki, Hideki; Hayashi, Hiroshi; Ono, Shigetoshi; and Okamura, Hisashi, 4,506,002, Cl. 430-215.000.
Opelika Manufacturing Corporation: *See*—
Brocklehurst, Charles E., 4,505,467, Cl. 270-53.000.
Optical Radiation Corporation: *See*—
Burk, Paul O., 4,504,982, Cl. 3-13.000.
O'Rourke, Leo M.: *See*—
Pronovost, Richard; Innis, Peter; and O'Rourke, Leo M., 4,505,127, Cl. 62-271.000.
Ortho Pharmaceutical Corporation: *See*—
Goldstein, Gideon; Heavner, George; Kroon, Daniel; and Audhya, Tapan, 4,505,853, Cl. 260-112.50R.
Orvet B.V.: *See*—
El-On, Joseph; and Jacobs, Geoffrey P., 4,505,901, Cl. 514-38.000.
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Suzuki, Takashi; Yamagata, Syuzi; and Osako, Jyunji, 4,505,354, Cl. 180-297.000.
Oshima, Shigeru: *See*—
Wong, Wan C.; and Oshima, Shigeru, 4,505,563, Cl. 354-234.100.
Osswald, Manfred; Rau, Hanns; and Fissmann, Hans-Joachim, to J. M. Voith, GmbH. Air blast apparatus for the dryer section of a paper making machine. 4,505,052, Cl. 34-114.000.
Osteen, John F., to DACAM Corporation. Carrier applicator. 4,505,089, Cl. 53-48.000.
Osterode, Ulrich, to Claudius Peters AG. Valve for abrasive mixtures. 4,505,292, Cl. 137-240.000.
Oszlar, Imre; Beck, Andras; and Mohacsi, Gabor, to Csepel Muvek Egyedi Gepgyara. Method and apparatus for electroslag welding. 4,506,130, Cl. 219-73.100.
Ota, Atsushi: *See*—
Tokui, Masaaki; Masaoka, Toshika; and Ota, Atsushi, 4,505,318, Cl. 164-113.000.
Otsubo, Isamu: *See*—
Kawamura, Hideo; Otsubo, Isamu; and Kitagawa, Tsutomu, 4,506,145, Cl. 219-499.000.
Otsuka, Shigeharu: *See*—
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Ott, Hans; Boegli, Rolf; Birch, Ulrich; Kipphan, Helmut; and Loffler, Gerhard, to Gretag Aktiengesellschaft. Process and apparatus for the colorimetric analysis of printed material. 4,505,589, Cl. 356-402.000.
Otu, Koichi: *See*—
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Overton, James F.: *See*—
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,506,092, Cl. 560-103.000.
Owen, Hartley: *See*—
Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., 4,506,106, Cl. 585-312.000.
Owens-Illinois, Inc.: *See*—
Kennedy, Leo J., 4,505,951, Cl. 427-55.000.
Owyang, King; and Stein, Leonard, deceased (by Stein, Vera, executrix), to General Electric Company. Semiconductor device with built-up low resistance contact. 4,505,029, Cl. 29-589.000.
Pacanowski, Ronald F.: *See*—
Kuchar, Paul J.; Sampson, Robert W.; and Pacanowski, Ronald F., 4,505,147, Cl. 73-29.000.
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Weydt, Willy V. D.; Hannen, Ulrich; and Paetzel, Herbert, 4,505,188, Cl. 92-94.000.
Pakshtas, Mechislav-Valentinas K.: *See*—
Yantsen, Ivan A.; Bekishev, Kenes K.; Savchak, Orest G.; Klok, Alexandr B.; Zhanabaev, Tolgat M.; Pakshtas, Mechislav-Valentinas K.; Glotov, Boris N.; Fink, Garold K.; Timkin, Alexei F.; Zorin, Nikolai I.; and Bobylev, Leonid M., 4,505,340, Cl. 173-134.000.
Palumbo, Stephen A. J., to Xerox Corporation. Non-image erase system for reproduction machines. 4,505,575, Cl. 355-14.00E.
Papay, Andrew G.; and O'Brien, Joseph P., to Edwin Cooper, Inc. Lubricating oil compositions containing graft copolymer as viscosity index improver-dispersant. 4,505,834, Cl. 252-51.50A.
Parent, Pierre: *See*—
Petetrot, Jean-Francois; and Parent, Pierre, 4,505,873, Cl. 376-216.000.
Paris, Jacques: *See*—
Angelie , Christian; Cauchetier, Michel; and Paris, Jacques, 4,505,791, Cl. 204-157.10R.
Parnell, Edgar W.: *See*—
Hatton, Leslie R.; Parnell, Edgar W.; and Roberts, David A., 4,505,740, Cl. 71-92.000.
Pascoe, William E.: *See*—
Hartman, Susan E.; Allen, Michael E.; and Pascoe, William E., 4,506,094, Cl. 560-118.000.
Pasztor, Rezso: *See*—
Asszonyi, Csaba; Klausz, Istvan; Kmety, Istvan; Meitzen, Nandor; and Pasztor, Rezso, 4,505,622, Cl. 405-288.000.
Patel, Gordhanbhai N.: *See*—
Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gordhanbhai N.; Poncha, Rustom P.; Skovrinski, Adam L.; and Lesco, James M., 4,505,786, Cl. 204-38.400.
Patel, Mahendra R.: *See*—
Jain, Nemichand B.; and Patel, Mahendra R., 4,505,890, Cl. 424-21.000.
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Hofmann, Dieter; and Weinhardt, Erolf, 4,506,187, Cl. 313-341.000.
Paton, Boris E.: *See*—
Makarov, Viktor M.; Paton, Boris E.; Globin, Nikolai K.; Usenko, Viktor G.; Khismatulin, Enver R.; Ziselman, Boris G.; Serov, Petr G.; Shel, Marat M.; and Rozenberg, Ovshiya O., 4,505,417, Cl. 228-17.700.
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Beneteau, Charles, 4,505,056, Cl. 36-117.000.
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Hackenberger, Alfred; Patsch, Manfred; and Gaeng, Manfred, 4,506,089, Cl. 560-020.000.
Paust, Joachim: *See*—
Weitz, Hans-Martin; Fischer, Rolf; and Paust, Joachim, 4,506,096, Cl. 560-262.000.
Pearson, Derek G., to Associated Lead Manufacturers Limited. Stabilizers for vinyl resins. 4,505,850, Cl. 252-609.000.
Pedrotte, Charles E., to Cormat, Inc. Buffing wheel hub. 4,504,999, Cl. 15-230.100.
Peery, John R.; and Eckenhoff, James B., to ALZA Corporation. Manually operable rotary syringe. 4,505,702, Cl. 604-209.000.
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Wilking, Hans; Heinrich, Kurt; and Peetz, Walter, 4,505,515, Cl. 297-362.000.
Pelletier, Robert: *See*—
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Pempera, Franz G.: *See*—
Jung, Helmut; Pempera, Franz G.; and Riedesel, Udo, 4,505,050, Cl. 34-54.000.
Pennington, Delmas B.: *See*—
Moore, Thomas S.; and Pennington, Delmas B., 4,505,972, Cl. 428-220.000.
Pennwalt Corporation: *See*—
Chen, Johnson C. H.; and Eichelberger, John L., 4,505,953, Cl. 427-212.000.
Pera, John D.: *See*—
Fenyes, Joseph G.; and Pera, John D., 4,505,831, Cl. 252-34.000.
Fenyes, Joseph G.; and Pera, John D., 4,506,081, Cl. 548-523.000.
Perchak, William C.; and Foos, Douglas E., to Plastofilm Industries, Inc. Container with integral closure. 4,505,404, Cl. 220-339.000.
Perciful, Jerry C.: *See*—
Whiteman, James R.; Edwards, Robert S.; and Perciful, Jerry C., 4,505,832, Cl. 252-42.100.

Pericomp Corporation: *See*—
Joannou, Kyriacos; and Coots, William P., 4,506,309, Cl. 360-137.000.
Perkin-Elmer Corporation, The: *See*—
Galburt, Daniel, 4,506,204, Cl. 318-653.000.
Trost, David; and Galburt, Daniel, 4,506,205, Cl. 318-653.000.
Perkins, Geoffrey W.: *See*—
Newton, Anthony D.; and Perkins, Geoffrey W., 4,506,292, Cl. 358-34.000.
permaTek, Inc.: *See*—
Lynch, Michael A., 4,505,629, Cl. 412-5.000.
Peters, Henry F.: *See*—
Fiarman, Sidney; Degen, Michael F.; and Peters, Henry F., 4,505,218, Cl. 116-200.000.
Peterson, Brian P.; and Murphy, Patrick J., to Cooper Industries, Inc. Anti-overload operating linkage for enclosed interlocked receptacle with safety switch or circuit breaker. 4,506,121, Cl. 200-50.00B.
Peterson, Gerald A. Excavating tooth, holder and retainer. 4,505,058, Cl. 37-142.00A.
Peterson, Robert R., to Barry Wright Corporation. Constant velocity coupling having laminated elastic bearings. 4,505,688, Cl. 464-111.000.
Petetrot, Jean-Francois; and Parent, Pierre, to Framatome & Cie. Method for regulating the power supplied to a steam turbine/pressurized water nuclear reactor. 4,505,873, Cl. 376-216.000.
Petrolite Corporation: *See*—
Bellos, Thomas J.; and Lovett, Eva G., 4,505,839, Cl. 252-344.000.
Petzow, Gunter: *See*—
Claussen, Nils; and Petzow, Gunter, 4,506,024, Cl. 501-105.000.
Pezzoli, Nello, to Vamatex S.p.A. Carrying gripper for looms. 4,505,305, Cl. 139-448.000.
Pfalzgraf, Manfred; and Graf, Kunibert, to VDO Adolf Schindling AG. Device for electrically controlling the speed of travel. 4,505,357, Cl. 180-335.000.
Pfizer Inc.: *See*—
Cooper, Kevin; Richardson, Kenneth; and Whittle, Peter J., 4,505,919, Cl. 514-340.000.
Pharmindustrie: *See*—
Champseix, Alain A.; Le Fur, Gerard R.; and Renault, Christian L. A., 4,505,916, Cl. 514-314.000.
Philipp, Warren H.: *See*—
Hsu, Li-Chen; Philipp, Warren H.; Sheibley, Dean W.; and Gonzalez-Sanabria, Olga D., 4,505,998, Cl. 429-206.000.
Phillips Petroleum Company: *See*—
DiBiano, Robert J.; Autenrieth, Kim A.; and Hales, Gary W., 4,505,668, Cl. 431-202.000.
Schuettenberg, Alexander D., 4,505,725, Cl. 44-66.000.
Wittenbach, Paul G., 4,505,420, Cl. 228-212.000.
Picozza, Augusto A., to Dart Industries Inc. Adjustable carrier for containers. 4,505,506, Cl. 294-161.000.
Pietsch, Gunter: *See*—
Bagaric, Stjepan; and Pietsch, Gunter, 4,505,207, Cl. 105-163.0SK.
Piller, Horst; and Kipper, Reinhold, to Carl-Zeiss-Stiftung. Illuminating device for microscopes. 4,505,555, Cl. 350-527.000.
Pinkhasov, Eduard, to Wedtech Corp. Method of coating ceramics and quartz crucibles with material electrically transformed into a vapor phase. 4,505,948, Cl. 427-37.000.
Pioneer Electronic Corporation: *See*—
Kawashima, Takao, 4,505,440, Cl. 242-199.000.
Noguchi, Tadashi, 4,506,376, Cl. 381-4.000.
Utsumi, Yoshihiro, 4,506,149, Cl. 250-202.000.
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Pischdotchian, Vahan. Hair trimming comb. 4,505,283, Cl. 132-45.00R.
Pissiotas, Georg: *See*—
Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,505,742, Cl. 71-93.000.
Pitney Bowes Inc.: *See*—
Dlugos, Daniel F., 4,506,330, Cl. 364-466.000.
Duwel, Edward C.; and Soderberg, John H., 4,506,329, Cl. 364-464.000.
Hubbard, David W., 4,506,344, Cl. 364-900.000.
Plastofilm Industries, Inc.: *See*—
Perchak, William C.; and Foos, Douglas E., 4,505,404, Cl. 220-339.000.
Plath, Peter; Rohr, Wolfgang; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Herbicides containing-3-aryl-5-methylpyrazole-4-carboxylic acid esters, their manufacture and use. 4,505,741, Cl. 71-92.000.
Plugge, Jerome R., to Talbot, Marcel G. Jogging cart. 4,505,490, Cl. 280-63.000.
Plumb, John L.: *See*—
Hope, Lawrence L.; and Plumb, John L., 4,506,193, Cl. 315-169.300.
Plummer, Mark A.; and Bugle, Robert C., to Marathon Oil Company. Hydrogen tetrachloroaluminate as a co-catalyst with sodium tetrachloroaluminate for the conversion of heavy hydrocarbons. 4,505,810, Cl. 208-108.000.
Poetsch, Edmund R.: *See*—
Koroncai, Adam I.; and Poetsch, Edmund R., 4,506,320, Cl. 363-141.000.
Pohl, Ludwig: *See*—
Romer, Michael; Pohl, Ludwig; and Eidenschink, Rudolf, 4,505,837, Cl. 252-299.600.
Pohn, Johann: *See*—
Landwehrkamp, Hans; Schneider, Gottfried; and Pohn, Johann, 4,505,102, Cl. 57-408.000.
Poindexter, Graham S., to Dow Chemical Company, The. Preparation of 2-haloethylamides. 4,505,859, Cl. 260-453.00P.
Poncha, Rustom P.: *See*—
Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gordhanbhai N.; Poncha, Rustom P.; Skovrinski, Adam L.; and Lesco, James M., 4,505,786, Cl. 204-38.400.
Ponsford, Roger J., to Beecham Group Limited. Therapeutic compounds containing β-lactams. 4,505,894, Cl. 424-114.000.
Pont-A-Mousson S.A.: *See*—
Barbe, Pierre L.; and Depoisson, Jean P., 4,505,453, Cl. 251-328.000.
Poole, Anthony G.: *See*—
Scales, John T.; Poole, Anthony G.; Wilson, David; and Middleton, Anthony J., 4,504,990, Cl. 5-459.000.
Porrot, Pascal; and Rougeolle, Daniel, to Thomson-CSF. Device for measuring the phase angle between a sine wave signal and a cyclic logic signal of the same frequency. 4,506,333, Cl. 364-487.000.
Porter, Thomas M., to H.K. Porter, Inc. Compound lever tools from sheet metal. 4,505,038, Cl. 30-193.000.
Position Orientation Systems, Ltd.: *See*—
Hansen, Per K., 4,506,354, Cl. 367-101.000.
Post Office, The: *See*—
Melia, Alan J., 4,506,212, Cl. 324-73.00R.
Powell, Joe R.: *See*—
Bishop, Charles D.; Powell, Joe R.; Stamps, Kenneth H.; and Watson, Clifford A., 4,505,194, Cl. 99-336.000.
Powell, Patrick L., to Standard Car Truck Company. Hubodometer adapted for selectable gear ratios. 4,506,147, Cl. 235-95.00B.
Power-Train, Inc.: *See*—
Jacobs, Stephan J., 4,505,185, Cl. 91-491.000.
Praria, Guy B., to Analogic Corporation. Method of making a voltage divider. 4,505,032, Cl. 29-621.000.
Prechtel, Georg, to Willy Scheuerle Fahrzeugfabrik GmbH & Co. Heavy-duty vehicle system. 4,505,347, Cl. 180-14.200.
Price, Donald L.; and Nechvatal, Van A. Night fishing signal. 4,505,063, Cl. 43-17.000.
Price, Vera H.; and Menefee, Emory. Human hair-grooming device. 4,504,998, Cl. 15-186.000.
Priepke, Edward H.: *See*—
Martenas, Wayne B.; and Priepke, Edward H., 4,505,434, Cl. 241-89.300.
Prince Corporation: *See*—
Clark, Russell L.; and Nestell, David E., 4,505,054, Cl. 33-357.000.
Prince, Edgar D., 4,505,317, Cl. 164-153.000.
Prince, Edgar D., to Prince Corporation. Prime mover for hot chamber die casting machines. 4,505,317, Cl. 164-153.000.
Prinz, Reinhard, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Method and means for compensating for image motion in an aerial camera. 4,505,559, Cl. 354-66.000.
Pro, George M. Cycle support for exercising. 4,505,473, Cl. 272-73.000.
Procter & Gamble Company, The: *See*—
Bush, Rodney D.; and Robbins, Medford D., 4,506,048, Cl. 524-100.000.
Proebsting, Robert J., to Mostek Corporation. Placement of clock circuits for semiconductor memory. 4,506,347, Cl. 365-51.000.
Progressive Assembly Machine Co., Inc.: *See*—
Rasmussen, Robert, 4,505,298, Cl. 137-540.000.
Prohaska, Peter, to International Standard Electric Corporation. Adjustable electro-optical device. 4,505,552, Cl. 350-392.000.
Pronovost, Richard; Innis, Peter; and O'Rourke, Leo M., to SOQUIP. Method and apparatus for treating natural gas from gas wells for safe transportation in pressure vessels. 4,505,127, Cl. 62-271.000.
Propper Manufacturing Co., Inc.: *See*—
Speelman, Irving A., 4,505,274, Cl. 128-337.000.
Prosnitz, Donald; and Szoke, Abraham, to United States of America, Energy. Free electron laser designs for laser amplification. 4,506,229, Cl. 330-4.300.
Proulx, Oliver J.: *See*—
Raes, Maurice C.; and Proulx, Oliver J., 4,506,040, Cl. 521-137.000.
Prudhon, Francois: *See*—
Frusta, Georges; and Prudhon, Francois, 4,505,667, Cl. 431-182.000.
Puckett, Clarence D.: *See*—
Thiry, William; Westlund, Arnold E., Jr.; and Puckett, Clarence D., 4,506,316, Cl. 362-309.000.
Puhak, Peter G., to North American Philips Consumer Electronics Corp. Laminated metallic means for dampening internal CRT vibrations. 4,506,188, Cl. 313-405.000.
Pundak, Nachman. Flexible linkage for the displacer assembly in cryogenic coolers. 4,505,119, Cl. 62-6.000.
Punttila, Antero: *See*—
Seppanen, Olli; Punttila, Antero; and Sulku, Jukka, 4,505,259, Cl. 126-429.000.
Pusic, Vladi; George, Benjamin T.; Smith, Monte E.; and Johnson, Craig B., to Sperry Corporation. Cache/disk file status indicator with data protection feature. 4,506,323, Cl. 364-200.000.
Quenzi, Phil, to Northern Industrial Sales & Service, Inc. Compact loader-trammer. 4,505,632, Cl. 414-510.000.
Questo, Warren O., to Sound Products Company L.P. Method and apparatus for switching multi-element transducer arrays. 4,505,156, Cl. 73-626.000.

Quibel, Jacques: *See*—
Lhonore, Pierre; Quibel, Jacques; Jacquinot, Bernard; Jestin, Yvon; and Pelletier, Robert, 4,505,879, Cl. 422-197.000.
Quick, Rolf: *See*—
Andersson, Karl-Hugo; Karlsson, Ingemar; and Quick, Rolf, 4,505,053, Cl. 34-155.000.
Quin, Mary P., to Raychem Corporation. Nickel/titanium/vanadium shape memory alloy. 4,505,767, Cl. 148-402.000.
Quin, Rene A.; Wiet, Paul A.; and Caputi, Jean-Louis M., to Compagnie Francaise Des Petroles. Apparatus for inserting a shut-off device laterally into a pipe. 4,505,295, Cl. 137-315.000.
Quinn, Ross A.: *See*—
Luce, Robert S.; and Quinn, Ross A., 4,506,226, Cl. 324-459.000.
Raab, Herman P. Function generator with means for selectively changing the discharge time constant. 4,506,177, Cl. 307-602.000.
Raczynski, Wladyslaw, to Framatome & Cie. Axial-flow centrifugal pump for the circulation of fluid. 4,505,637, Cl. 415-112.000.
Radue, Anna K.: *See*—
Hershberger, Charles L.; Radue, Anna K.; and Rosteck, Paul R., Jr., 4,506,013, Cl. 435-172.300.
Raes, Maurice C.; and Proulx, Oliver J., to Olin Corporation. Preparation of a stable dispersion from TDI residue and its use in the production of polyurethane compositions. 4,506,040, Cl. 521-137.000.
Raines, David W., to Robert Morton DG Limited. Lauter tuns. 4,505,941, Cl. 426-489.000.
Ramachandran, Kovilvila; and Giani, Enrico, to Canadian Patents and Development Limited. Magnetron sputtering apparatus. 4,505,798, Cl. 204-298.000.
Ramesohl, Hubert: *See*—
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Rance, Robert W., to Dow Chemical Rheinwerk GmbH. Water-in-oil emulsions having improved low temperature properties. 4,506,051, Cl. 524-233.000.
Rancudo, Thomas J., Jr.: *See*—
Leech, Charles A., III; Rancudo, Thomas J., Jr.; and Groman, James W., 4,505,297, Cl. 137-561.00A.
Ransburg Corporation: *See*—
Rodgers, Michael C.; and Michels, Geoffrey H., 4,505,430, Cl. 239-112.000.
Woodruff, Frederick W.; Hughey, Daniel C.; and Smart, William L., 4,506,260, Cl. 340-649.000.
Rasmussen, Robert, to Progressive Assembly Machine Co., Inc. Fluid dispensing valve assembly. 4,505,298, Cl. 137-540.000.
Rasnick, David W.; and Bissell, Eugene R., to Enzyme Systems Products. 7-Amino-4-trifluoromethylquinolone derived substrates and method for determining enzymes and inhibitors. 4,505,852, Cl. 260-112.50R.
Rasshofer, Werner: *See*—
Balle, Gerhard; Rasshofer, Werner; and Schoberth, Winfried, 4,506,039, Cl. 521-137.000.
Rau, Hanns: *See*—
Osswald, Manfred; Rau, Hanns; and Fissmann, Hans-Joachim, 4,505,052, Cl. 34-114.000.
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Rawson Control Systems Inc.: *See*—
Lorenc, Allan L.; and Maring, Thomas L., 4,505,472, Cl. 272-1.00C.
Raychem Corporation: *See*—
Clarke, Raymond, 4,505,542, Cl. 350-96.330.
Gen, Tamar G.; and Cydzik, Edward A., 4,505,421, Cl. 228-224.000.
Hine, Jean-Patrick; and McGaffigan, Thomas H., 4,505,532, Cl. 339-75.00M.
Quin, Mary P., 4,505,767, Cl. 148-402.000.
Rhodes, Thomas R., 4,506,259, Cl. 340-640.000.
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RCA Corporation: *See*—
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Lewis, Henry G., Jr., 4,506,288, Cl. 358-21.00R.
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Reitmeier, Glenn A.; and Aschwanden, Felix, 4,506,175, Cl. 307-525.000.
Young, James R.; and VanBreemen, Bertram, 4,506,295, Cl. 358-60.000.
Reba, Imants, to Crown Zellerbach Corporation. Pneumatic conveyor system for flexible webs. 4,505,412, Cl. 225-96.000.
Redman, John W. Chord hand callus exerciser. 4,505,178, Cl. 84-465.000.
Redmond, William G., Jr., to LTV Aerospace and Defense Company. Small deadband servocontrol system. 4,506,203, Cl. 318-624.000.
Redpath, Thomas W. T.: *See*—
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,506,222, Cl. 324-309.000.
Reed Lignin Inc.: *See*—
Detroit, William J., 4,505,825, Cl. 252-8.50C.
Reed, William M., to CPC International Inc. Production of organic acids by a continuous fermentation process. 4,506,012, Cl. 435-139.000.
Regalbuto, John A.; Christopher, Glenn B.; and Motley, Jerry D., to Jet Research Center, Inc. Underwater stud gun system and method for attaching an article to an underwater structure. 4,505,018, Cl. 29-432.000.
Rehman, William R.: *See*—
Cobbs, Walter H., Jr.; and Rehman, William R., 4,505,406, Cl. 222-135.000.
Cobbs, Walter H., Jr.; and Rehman, William R., 4,505,957, Cl. 427-422.000.
Reichel, Artur, to Ernst Leitz Wetzlar GmbH. Microtome. 4,505,175, Cl. 83-703.000.
Reichert, William W.: *See*—
Cody, Charles A.; Reichert, William W.; Kemnetz, Steven J.; and Magauran, Edward D., 4,505,886, Cl. 423-616.000.
Reichhold Chemicals Incorporated: *See*—
White, James T., Sr.; and Kennedy, Dan J., 4,506,060, Cl. 525-163.000.
Reichl, Richard: *See*—
Kummer, Werner; Koppe, Herbert; Stahle, Helmut; Reichl, Richard; and Kuhn, Franz J., 4,505,912, Cl. 514-236.000.
Reidt, Dean K., to Minnesota Mining and Manufacturing Company. Locating fixture assembly. 4,505,034, Cl. 29-749.000.
Reimer, William A., to GTE Automatic Electric Inc. Electrical apparatus frame. 4,505,394, Cl. 211-41.000.
Reimer, William A., to GTE Automatic Electric Inc. Low insertion force connection arrangement. 4,505,527, Cl. 339-17.0LM.
Reimer, William A., to GTE Automatic Electric Inc. Low insertion force connection arrangement. 4,505,528, Cl. 339-17.0LM.
Reinartz, Hans-Dieter; and Vatter, Waldemar, to ITT Industries, Inc. Plastic compensating reservoir for hydraulic brake systems. 4,505,113, Cl. 60-535.000.
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Baumeister, Peter; Reinehr, Dieter; and Rosenegger, Eckehard, 4,506,099, Cl. 564-413.000.
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Uhlemann, Hans, to Bayer Aktiengesellschaft. Preparation of low residual solvent content polyacrylonitrile filaments. 4,505,870, Cl. 264-206.000.
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Reitmeier, Glenn A.; and Aschwanden, Felix, to RCA Corporation. Digital phase comparator circuit producing sign and magnitude outputs. 4,506,175, Cl. 307-525.000.
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Renz, Peter. Apparatus for laminating sheets with a plastic film. 4,505,772, Cl. 156-355.000.
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Research One Limited Partnership: *See*—
Scheetz, Barry; Rizer, Janine M.; and Hahn, Michael, 4,505,753, Cl. 106-90.000.
Reuter, Frederick A.; and Moorman, Charles J., to Dosimeter Corporation of America. Dosimeter charging apparatus. 4,506,159, Cl. 250-377.000.
Revere, Peter W.; and Campbell, Frank, Jr., to Cameron Iron Works, Inc. Pipe and insulator therefor. 4,505,303, Cl. 138-149.000.
Reynolds, Frank: *See*—
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Reynolds Metals Company: *See*—
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Swenck, George F., 4,505,370, Cl. 194-4.00C.
Rezac, Howard D. Revolving floor apparatus for trailers. 4,505,634, Cl. 414-528.000.
Rheinmetall GmbH: *See*—
Schneider, Bernhard; and Menges, Horst, 4,505,181, Cl. 89-33.040.
Rhodes, Thomas R., to Raychem Corporation. Digital fault monitor for conductive heaters. 4,506,259, Cl. 340-640.000.
Ribi, Edgar E.; and Cantrell, John L., to Ribi ImmunoChem Research, Inc. Refined detoxified endotoxin product. 4,505,899, Cl. 514-8.000.
Ribi, Edgar E.; Schwartzman, Steven M.; and Cantrell, John L., to Ribi ImmunoChem Research, Inc. Refined detoxified endotoxin product. 4,505,900, Cl. 514-2.000.
Ribi ImmunoChem Research, Inc.: *See*—
Cantrell, John L., 4,505,903, Cl. 424-195.100.
Ribi, Edgar E.; and Cantrell, John L., 4,505,899, Cl. 514-8.000.
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Rice, Glen V.: *See*—
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Rice, Richard M.; Watling, Robert E.; and Henderson, Drew R., to Reynolds Metals Company. Wire temperature controller. 4,506,146, Cl. 219-499.000.
Richards, William D., to Comfort Auto Industries, Inc. Automobile roof panel lock. 4,505,139, Cl. 70-221.000.
Richardson, James E.: *See*—
Howes, James P.; and Richardson, James E., 4,505,132, Cl. 62-457.000.
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Richardson-Vicks Ltd.: *See*—
Taylor, Peter; and Levy, Alan A., 4,505,924, Cl. 514-399.000.
Richdel, Inc.: *See*—
Saarem, Myrl J.; and Lovelace, Donald E., 4,505,450, Cl. 251-24.000.
Richter, Heinz, to Messerschmitt-Boelkow-Blohm GmbH. Method for producing oriented fleeces or mats of short length fibers. 4,505,777, Cl. 162-102.000.
Ricks, Tom E., Sr. Methods of and means for low volume wellhead compression hydrocarbon gas. 4,505,333, Cl. 166-267.000.
Ricoh Company, Ltd.: *See*—
Funato, Hiroyoshi, 4,505,537, Cl. 350-3.710.
Inokuchi, Toshiyuki, 4,505,570, Cl. 355-3.00R.
Koizumi, Yutaka, 4,505,577, Cl. 355-15.000.
Sakamoto, Hiroshi; Inaba, Norihiko; and Taniguchi, Keishi, 4,506,278, Cl. 346-216.000.
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Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., 4,505,495, Cl. 280-651.000.
Riedesel, Udo: *See*—
Jung, Helmut; Pempera, Franz G.; and Riedesel, Udo, 4,505,050, Cl. 34-54.000.
Rieger, Franz: *See*—
Damson, Eckart; Moser, Winfried; Muller, Klaus; Rieger, Franz; and Schubler, Rainer, 4,506,186, Cl. 313-129.000.
Rieter Machine Works Limited: *See*—
Staehli, Urs, 4,505,005, Cl. 19-200.000.
Riethmiller, Mark R. Golfer's aid. 4,505,478, Cl. 273-32.00H.
Rigden, Sydney A. R.; and Sweet, Ian J. H., to General Electric Company p.l.c., The. Cathodoluminescent light sources and electric lighting arrangements including such sources. 4,506,194, Cl. 315-200.00R.
Right, Robert W.; and Mande, Irving, to General Signal Corporation. Alarm system with detectors and signaling devices on the same cable pair. 4,506,254, Cl. 340-510.000.
Right, Robert W.: *See*—
Mande, Irving; Right, Robert W.; and Killian, George W., 4,506,253, Cl. 340-506.000.
Rinnai Kabushiki Kaisha: *See*—
Mizuno, Sueo; Mizutani, Katsushi; and Koumura, Masahiko, 4,505,253, Cl. 126-351.000.
Rion, Jacky, to Commissariat a l'Energie Atomique. Device for regulating the flow of a fluid. 4,505,877, Cl. 376-352.000.
Riso Kagaku Corporation: *See*—
Hasegawa, Takanori; and Shimada, Takanobu, 4,505,199, Cl. 101-127.100.
Rittal-Werk Rudolf LOH GmbH & Co., KG: *See*—
Erlam, David P., 4,505,392, Cl. 211-26.000.
Ritter, Jim: *See*—
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Rizer, Janine M.: *See*—
Scheetz, Barry; Rizer, Janine M.; and Hahn, Michael, 4,505,753, Cl. 106-90.000.
Robbins, Medford D.: *See*—
Bush, Rodney D.; and Robbins, Medford D., 4,506,048, Cl. 524-100.000.
Robert Bosch GmbH: *See*—
Ackermann, Fritz; and Schnaibel, Eberhard, 4,505,368, Cl. 192-0.092.
Adalbert, Gerhard; and Vysiotis, Theodoros, 4,505,656, Cl. 418-270.000.
Bolenz, Klaus; and Liedl, Franz, 4,506,162, Cl. 290-38.00A.
Damson, Eckart; Moser, Winfried; Muller, Klaus; Rieger, Franz; and Schubler, Rainer, 4,506,186, Cl. 313-129.000.
Eheim, Franz, 4,505,241, Cl. 123-373.000.
Hobbs, John; and Schrader, Wolfgang, 4,505,344, Cl. 177-136.000.
Kammeyer, Karl-Dirk, 4,506,228, Cl. 329-107.000.
Rothley, Manfred; Zabler, Erich; Neuffer, Kurt; and Reinhart, Karl-Franz, 4,506,217, Cl. 324-208.000.
Straubel, Max, 4,505,242, Cl. 123-383.000.
Robert Morton DG Limited: *See*—
Raines, David W., 4,505,941, Cl. 426-489.000.
Roberts, David A.: *See*—
Hatton, Leslie R.; Parnell, Edgar W.; and Roberts, David A., 4,505,740, Cl. 71-92.000.
Roberts, John R., Jr.: *See*—
Angle, Lonnie L.; and Roberts, John R., Jr., 4,505,327, Cl. 165-48.00R.
Roberts, Joseph M., Sr. Portable all purpose electrical alarm. 4,506,257, Cl. 340-521.000.
Roberts, Paul N.: *See*—
Seymour, Stephen R.; Guy, Robert K.; and Roberts, Paul N., 4,505,150, Cl. 73-116.000.
Roberts, Richard W., to Borg-Warner Corporation. Method of manufacturing a die-cast wobble plate assembly. 4,505,016, Cl. 29-156.50R.
Roberts, Richard W., to Borg-Warner Corporation. Capacity control for rotary vane compressor. 4,505,653, Cl. 418-23.000.
Robertshaw Controls Company: *See*—
Frankenberg, Alfred A.; and Scott, Douglas R., 4,505,106, Cl. 60-286.000.
Robertson, John R., to ICI Americas Inc. Paper products sized with polyisocyanate blends. 4,505,778, Cl. 162-135.000.
Rock, Erich; and Hollenstein, Helmut, to Julius Blum Gesellschaft m.b.H. Joining device. 4,505,610, Cl. 403-231.000.
Rockwell International Corporation: *See*—
Dumas, Ted A.; Vet, Maarten; and Buchmeyer, Sam K., 4,506,265, Cl. 343-704.000.
Fedde, Chris D.; and Carter, Dennis L., 4,506,385, Cl. 455-226.000.
Landt, Harvey L., 4,506,209, Cl. 324-57.00R.
Matzek, Lester T., 4,506,237, Cl. 333-28.00R.
Mollman, Walter G., 4,506,118, Cl. 200-1.00R.
Soclof, Sidney I., 4,506,283, Cl. 357-51.000.
Statkus, George M., 4,505,378, Cl. 198-710.000.
Thompson, William J., 4,506,232, Cl. 331-16.000.
Roder, Manfred, to Smithers-Oasis Company. Means for removably securing a decorative item to a nonporous surface. 4,505,446, Cl. 248-205.800.
Rodgers, Michael C.; and Michels, Geoffrey H., to Ransburg Corporation. Self-cleaning atomizer. 4,505,430, Cl. 239-112.000.
Roeder, Robert J., to Kimberly-Clark Corporation. Sanitary napkin with multi-configurational capabilities. 4,505,704, Cl. 604-385.000.
Roelevink, Bauke J.: *See*—
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Rogers, Charles J.: *See*—
Huni, Jean-Paul R.; Hollingshead, Ethan A.; Edgeworth, Thomas G.; Sood, Raman R.; Dewing, Ernest W.; and Rogers, Charles J., 4,505,796, Cl. 204-243.00R.
Rogers, John, to Dynamelt Limited. Liquefying hot melt adhesive. 4,505,669, Cl. 432-13.000.
Rogghe, Hugo: *See*—
Cozac, Daniel; and Rogghe, Hugo, 4,505,781, Cl. 156-640.000.
Rohdin, Freddie L., to Aktiebolaget Electrolux. Two pole reluctance motor with non uniform pole shape for better starting. 4,506,182, Cl. 310-193.000.
Rohm and Haas Company: *See*—
Amick, David R., 4,505,889, Cl. 424-21.000.
Moore, Thomas S.; and Pennington, Delmas B., 4,505,972, Cl. 428-220.000.
Rohr, Wolfgang: *See*—
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Rolls-Royce Limited: *See*—
Seymour, Stephen R.; Guy, Robert K.; and Roberts, Paul N., 4,505,150, Cl. 73-116.000.
Simmons, Roy, 4,505,104, Cl. 60-39.091.
Romer, Michael; Pohl, Ludwig; and Eidenschink, Rudolf, to Merck Patent Gesellschaft mit beschrankter Haftung. Liquid crystalline phenylcyclohexene derivatives. 4,505,837, Cl. 252-299.600.
Romer, Michael; Krause, Joachim; and Weber, Georg, to Merck Patent Gesellschaft mit beschrankter Haftung. Halogenobiphenyl derivatives. 4,505,838, Cl. 252-299.630.
Roos, George E.: *See*—
Nelson, Steve; Reynolds, Frank; Roos, George E.; and Ball, John, 4,505,179, Cl. 89-1.00G.
Rose, Daniel C.: *See*—
Hodgkins, Charles E.; Rose, Daniel C.; and Coller, Dana L., 4,506,026, Cl. 501-135.000.
Rose, Gene D.; Dennis, Kent S.; and Evani, Syamalarao, to Dow Chemical Company, The. Triblock polymers of the BAB type having hydrophobic association capabilities for rheological control in aqueous systems. 4,505,827, Cl. 252-8.55R.
Rose, Reinhold R.; and Lieberman, Lance J., to Rose, Reinhold R. Dual timing event stopwatch. 4,505,595, Cl. 368-110.000.
Rose, William H.; Rupnik, David W.; and Shaffer, David T., to AMP Incorporated. Push-push switch. 4,506,124, Cl. 200-153.00J.
Rosenegger, Eckehard: *See*—
Baumeister, Peter; Reinehr, Dieter; and Rosenegger, Eckehard, 4,506,099, Cl. 564-413.000.
Rosin, Donald A.: *See*—
Field, Martin J.; Makusij, Andrew J.; and Rosin, Donald A., 4,505,296, Cl. 137-510.000.
Ross, John P.; and Bernardi, Carl E., to National Semiconductor Corporation. Balanced force roller. 4,505,015, Cl. 29-116.00R.
Rossi, Alberto: *See*—
Ferrini, Pier G.; Rossi, Alberto; and Haas, Georges, 4,505,913, Cl. 514-183.000.
Rossi, Vince; Miller, James R.; Tetrault, Leonard P.; and Tripodi, Robert R., to Censor Electronics, Inc. Room temperature control system responsive to movement by occupant and to ambient temperature. 4,505,426, Cl. 236-47.000.
Rosteck, Paul R., Jr.: *See*—
Hershberger, Charles L.; Radue, Anna K.; and Rosteck, Paul R., Jr., 4,506,013, Cl. 435-172.300.

Roth, Kurt: *See—*
Buhler, Ulrich; Ribka, Joachim; Tappe, Horst; and Roth, Kurt, 4,505,856, Cl. 534-753.000.

Roth, Martin: *See—*
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,505,794, Cl. 204-159.240.
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,506,083, Cl. 549-27.000.

Rothley, Manfred; Zabler, Erich; Neuffer, Kurt; and Reinhart, Karl-Franz, to Robert Bosch GmbH. Gear tooth position and speed sensor with four, bridge circuit connected, magnetic resistance tracks. 4,506,217, Cl. 324-208.000.

Rotron Incorporated: *See—*
Brown, Fred A.; and Grouse, Alan F., 4,506,218, Cl. 324-158.0MG.

Rott, Joachim; Thelen, Wolfgang; and Hesselbrock, Bernd, to Krone GmbH. Measuring apparatus for the automatic measurement of speed, travelled distance and directional changes of a movable body. 4,506,353, Cl. 367-91.000.

Rougeolle, Daniel: *See—*
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Rowan, Henry M.: *See—*
Boehm, Paul C.; Mortimer, John H.; Rowan, Henry M.; and Turner, Robert C., 4,506,131, Cl. 219-10.770.

Rowell, Douglas W.: *See—*
Ziemek, Gerhard; Schatz, Friedrich; Muller, Dieter; and Rowell, Douglas W., 4,506,135, Cl. 219-107.000.

Rowenhorst, Donley D.: *See—*
Gabor, Thomas; Broberg, David E.; Dierssen, Gunther H.; and Rowenhorst, Donley D., 4,505,720, Cl. 51-295.000.

Rozenberg, Ovshiya O.: *See—*
Makarov, Viktor M.; Paton, Boris E.; Globin, Nikolai K.; Usenko, Viktor G.; Khismatulin, Enver R.; Ziselman, Boris G.; Serov, Petr G.; Shel, Marat M.; and Rozenberg, Ovshiya O., 4,505,417, Cl. 228-17.700.

RTC Industries, Inc.: *See—*
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RTE Corporation: *See—*
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Rubenstein, Irving H.: *See—*
Bank, Herbert M.; and Rubenstein, Irving H., 4,505,220, Cl. 118-16.000.

Rubin, Ben. Portable exerciser. 4,505,476, Cl. 272-146.000.

Ruckdeschel, Lawrence M.: *See—*
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Ruckert, Hans; Buhr, Gerhard; and Steppan, Hartmut, to Hoechst Aktiengesellschaft. Positive-working radiation-sensitive mixture. 4,506,003, Cl. 430-270.000.

Ruckert, Hans, to Hoechst Aktiengesellschaft. Process for preparing relief images in imaged irradiated light-sensitive material having acid-cleavable compound by hot air treatment, overall irradiation and alkaline development. 4,506,006, Cl. 430-325.000.

RUD-Kettenfabrik Rieger & Dietz GmbH u. Co.: *See—*
Dalferth, Hans H.; and Bauer, Johannes, 4,505,103, Cl. 59-85.000.

Rudd, Larry R.: *See—*
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Rudolph, Hans: *See—*
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Rudolphy, Albert: *See—*
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Ruegg, Christoph; and Voirol, Peter, to Ciba-Geigy Corporation. Pin for connecting machine elements with each other. 4,505,979, Cl. 428-379.000.

Rueter, John C.: *See—*
Markowitz, Harold T.; Rueter, John C.; and Duffin, Edwin G., 4,505,276, Cl. 128-697.000.

Ruhland, Michael: *See—*
Zeugner, Horst; Ruhland, Michael; Liepmann, Hans; Milkowski, Wolfgang; and Muesch, Herbert, 4,505,908, Cl. 514-221.000.

Rupnik, David W.: *See—*
Rose, William H.; Rupnik, David W.; and Shaffer, David T., 4,506,124, Cl. 200-153.00J.

Ruschek, Gerhard: *See—*
Sauerschell, Wolfgang; Ruschek, Gerhard; and Mann, Arnold, 4,505,151, Cl. 73-116.000.

Ryan, John W., to Agrowparts Pty Ltd. Plow jump mechanism. 4,505,337, Cl. 72-260.500.

Saab-Scania Aktiebolag: *See—*
Gadefelt, Bengt G.; and Enlund, Birger S. I., 4,505,348, Cl. 180-89.140.

Saarem, Myrl J.; and Lovelace, Donald E., to Richdel, Inc. Solenoid-operated pilot-actuated valve. 4,505,450, Cl. 251-24.000.

Saari, Walfred S.: *See—*
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Huff, Joel R.; Saari, Walfred S.; and Baldwin, John J., 4,506,074, Cl. 546-278.000.

Sackett, James A.: *See—*
McNeel, William O.; and Sackett, James A., 4,505,014, Cl. 29-25.350.

Sagami Chemical Research Center: *See—*
Ichikawa, Masaru, 4,506,033, Cl. 518-716.000.

Sagawa, Wataru: *See—*
Sugihara, Isao; Sagawa, Wataru; Ikegami, Tsukasa; and Shimizu, Tasuku, 4,505,763, Cl. 148-127.000.

Sagol, Sami, to Keter Plastic (USA) Inc. Beverage container with collapsible legs. 4,505,408, Cl. 222-185.000.

Sailor, Vernon R. Door or window frame assembly. 4,505,080, Cl. 52-211.000.

Saito, Junji: *See—*
Oguri, Yasuo; Saito, Junji; and Kijima, Naoto, 4,505,866, Cl. 264-42.000.

Saito, Shigeo: *See—*
Onishi, Toshitada; Tateishi, Hiroshi; Koyama, Kenichi; Saito, Shigeo; and Nagata, Masayuki, 4,506,109, Cl. 174-128.00S.

Saito, Takeo: *See—*
Onda, Takanori; and Saito, Takeo, 4,505,352, Cl. 180-219.000.

Saito, Toru: *See—*
Ichikawa, Masashi; Saito, Toru; and Nishi, Takeshi, 4,506,134, Cl. 219-100.000.

Saitoh, Hiroyuki: *See—*
Kurata, Masami; Saitoh, Hiroyuki; and Matsuda, Masakane, 4,505,574, Cl. 355-14.00E.

Sakaguchi, Shinji; Okamura, Hisashi; and Nakamura, Shigeru, to Fuji Photo Film Co., Ltd. Photographic recording material containing novel coordination polymer. 4,506,001, Cl. 430-213.000.

Sakaguchi, Yasuhide: *See—*
Usami, Kenichi; Kirihara, Seishin; Doi, Hiroyuki; Asano, Choichi; Sukekawa, Masayuki; and Sakaguchi, Yasuhide, 4,505,232, Cl. 122-511.000.

Sakai, Kazuo: *See—*
Akiba, Shigeyuki; Sakai, Kazuo; Utaka, Katsuyuki; and Matsushima, Yuichi, 4,506,367, Cl. 372-45.000.

Sakai, Kouichi: *See—*
Ogawa, Yoshinari; Sakai, Kouichi; and Akagi, Noriyuki, 4,506,043, Cl. 523-523.000.

Sakai, Makiko, to Shionogi & Co., Ltd. Process for preparing indoles. 4,506,079, Cl. 548-503.000.

Sakamoto, Hiroshi; Inaba, Norihiko; and Taniguchi, Keishi, to Ricoh Company, Ltd. Thermosensitive recording material. 4,506,278, Cl. 346-216.000.

Sakamoto, Masaharu: *See—*
Yoshikawa, Shoji; Ohshima, Ken; Kodama, Hiroshi; Yamamiya, Kunio; Sakamoto, Masaharu; and Kato, Kiichi, 4,505,585, Cl. 356-237.000.

Sako, Yuji: *See—*
Okado, Hiroyuki; Kakizoe, Masahiro; Otsuka, Shigeharu; and Sako, Yuji, 4,506,243, Cl. 335-132.000.

Sakuma, Kazuyoshi; Nihei, Tetsuo; and Maki, Toshio, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for simultaneous both-end shaping of workpiece. 4,505,144, Cl. 72-345.000.

Sakurai, Hideo: *See—*
Makino, Kenya; Sakurai, Hideo; Toyoda, Toshiyuki; and Matsuo, Yoshitaka, 4,506,061, Cl. 526-142.000.

Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikazu; Kawata, Toshikatsu; Kiboshi, Shinzi; and Shibata, Akiyoshi, to Mitsubishi Gas Chemical Co., Inc. Acetal resin composition. 4,506,053, Cl. 524-405.000.

Salia-Munoz, Miguel. Apparatus for applying light through an optical grid. 4,505,545, Cl. 350-321.000.

Salmon, Stuart C.; and Zeltner, Larry D., to General Electric Company. Fixturing device. 4,505,075, Cl. 51-165.750.

Salzburg, Herbert; Hajek, Manfred; and Meyborg, Holger, to Bayer Aktiengesellschaft. Process for the production of dianhydrohexitol mixtures and liquid mixture of dianhydrohexitols. 4,506,086, Cl. 549-464.000.

Sampson, John L.: *See—*
Ludman, Jacques E.; Sampson, John L.; and Caulfield, Henry J., 4,505,588, Cl. 356-354.000.

Sampson, Robert W.: *See—*
Kuchar, Paul J.; Sampson, Robert W.; and Pacanowski, Ronald F., 4,505,147, Cl. 73-29.000.

Sanborn, James R., to Shell Oil Company. S-(1-(1-Cyanoalkylthio)alkyl)phosphorodithioic compounds as pesticides. 4,505,904, Cl. 514-112.000.

Sandberg, Christopher T.; and Mosher, Eugene L., to Truth Incorporated. Retainer bearing and bearing assembly for a window operator and assembly method and tool. 4,505,601, Cl. 384-428.000.

Sanden Corporation: *See—*
Terauchi, Kiyoshi; Kawano, Akihiro; and Mabe, Atsushi, 4,505,651, Cl. 417-440.000.

Sanders Associates, Inc.: *See—*
Hayner, Paul F., 4,506,221, Cl. 324-256.000.

Sanders, Winfred J.: *See—*
Menon, Govind K.; and Sanders, Winfred J., 4,505,917, Cl. 514-347.000.

Sandoz Ltd.: *See—*
Egli, Robert, 4,505,857, Cl. 534-768.000.

Sangiorgi, Mario, to Mazzini Motori S.r.l. Sewing machine motor unit. 4,505,366, Cl. 192-18.00B.

Sano, Shoichi; and Furukawa, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 4,505,491, Cl. 280-91.000.

Sanraku-Ocean Co., Ltd.: *See—*
Yamada, Yasuji, 4,506,085, Cl. 549-451.000.

Santos, Stephen: *See—*
Moore, Herbert; Santos, Stephen; and Wysong, Robert D., 4,505,888, Cl. 424-1.100.

Santrade Ltd.: *See*—
Lundvall, Nils G., 4,505,625, Cl. 408-155.000.
Sanyo Electric Co., Ltd.: *See*—
Kusakabe, Hiroyoshi; Ishiko, Hideo; Okumura, Takeshi; Izumi, Masashi; and Furukawa, Masahiro, 4,505,123, Cl. 62-148.000.
Sarda, Nandy M., to U.S. Filigree Wideslab, Inc. Method of construction of concrete decks with haunched supporting beams. 4,505,087, Cl. 52-741.000.
Sargent, Harold L. Combined boat trailer and portable dock apparatus. 4,505,619, Cl. 405-220.000.
Sasaki, Isao, to Nittan Company, Limited. Operation test circuit for fire detectors. 4,506,255, Cl. 340-514.000.
Sasaki, Ken: *See*—
Umeda, Takao; Simazaki, Yuzuru; Igawa, Tatsuo; Tanno, Seikichi; Sasaki, Ken; and Miyashita, Takao, 4,505,546, Cl. 350-334.000.
Sase, Masahiro: *See*—
Kawahara, Hisashi; Kihara, Hiroyuki; and Sase, Masahiro, 4,505,594, Cl. 368-73.000.
Sasib S.p.A.: *See*—
Cristiani, Athos, 4,505,280, Cl. 131-94.000.
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, to Nippon Petrochemical Company, Limited. Electrical insulating oil and oil-filled electrical appliances. 4,506,107, Cl. 174-25.00C.
Sato, Nobuo, to Yoshino Kogyosho Co., Ltd. Device for supplying piece to biaxial orientation blow molding machine. 4,505,372, Cl. 198-404.000.
Sato, Shoichi: *See*—
Endo, Yoichi; Nakanishi, Kazuo; Namura, Hideki; Doi, Terukazu; Kusumoto, Katsunori; Shimizu, Kazuyuki; Yoshimi, Kazuhiko; Nagai, Shigeru; and Sato, Shoichi, 4,505,217, Cl. 114-103.000.
Sato, Tadashi: *See*—
Sugiura, Susumu; Sato, Tadashi; and Nakajima, Norio, 4,505,576, Cl. 355-14.00R.
Sato, Yo; Kashiwaba, Tadao; Matsuda, Yasuhiko; and Oikawa, Tadahisa, to Kabushiki Kaisha Sato. Automatic label winding and charging device. 4,505,773, Cl. 156-384.000.
Sato, Youji: *See*—
Nagashima, Tsuneyasu; and Sato, Youji, 4,505,611, Cl. 403-406.000.
Satoh, Kenji, to Hitachi Heating Appliances Co., Ltd. High-frequency heating apparatus. 4,506,127, Cl. 219-10.55B.
Satoh, Shogi: *See*—
Ariga, Yoshio; Ishige, Yoshiki; Satoh, Shogi; Tegawa, Masao; Kinugasa, Toshiyuki; and Yamamoto, Toru, 4,505,774, Cl. 156-499.000.
Sauerschell, Wolfgang; Ruschek, Gerhard; and Mann, Arnold, to VDO Adolf Schindling AG. Position indicator which can be coupled to a gas pedal in order to control the speed of travel of an automotive vehicle. 4,505,151, Cl. 73-116.000.
SAVA KRANJ industrija gumijevih, usnjenih in kemicnih izdelkov n.o.sol.o.: *See*—
Munih, Pavel, 4,506,034, Cl. 521-41.000.
Savas, Charles R., to Eaton Corporation. Trigger speed control switch. 4,506,198, Cl. 318-301.000.
Savchak, Orest G.: *See*—
Yantsen, Ivan A.; Bekishev, Kenes K.; Savchak, Orest G.; Klok, Alexandr B.; Zhanabaev, Tolgat M.; Pakshtas, Mechislav-Valentinas K.; Glotov, Boris N.; Fink, Garold K.; Timkin, Alexei F.; Zorin, Nikolai I.; and Bobylev, Leonid M., 4,505,340, Cl. 173-134.000.
Sawada, Takeshi; Yoneda, Kou; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Temperature compensated magnetoresistive effect thin film magnetic sensor. 4,506,220, Cl. 324-252.000.
Sawyer, Edgar W., Jr., to ITT Corporation. Combustible coal/water mixture for fuels and methods of preparing same. 4,505,716, Cl. 44-51.000.
Scales, John T.; Poole, Anthony G.; Wilson, David; and Middleton, Anthony J., to Courtaulds PLC. Fire resistant support for the human body. 4,504,990, Cl. 5-459.000.
Scapa-Porritt Limited: *See*—
Wheeldon, John B.; Jeffery, John; and Myerscough, Paul F., 4,505,383, Cl. 198-853.000.
Schaffran, Dean L.: *See*—
Kelly, Lawrence S.; Schaffran, Dean L.; and Nii, Donald S., 4,505,405, Cl. 222-135.000.
Schaller, Helmut F. K. Attachment for releasably holding stemmed tools. 4,505,177, Cl. 84-329.000.
Schantz, Ronald K.: *See*—
Kramer, Lee F.; Schantz, Ronald K.; Kirkham, Steven C.; and Tschanz, Charles M., 4,505,339, Cl. 172-812.000.
Schatz, Friedrich: *See*—
Ziemek, Gerhard; Schatz, Friedrich; Muller, Dieter; and Rowell, Douglas W., 4,506,135, Cl. 219-107.000.
Schaub, Thomas: *See*—
Massey, James L.; and Schaub, Thomas, 4,506,372, Cl. 375-116.000.
Scheef, Wolfgang: *See*—
Biedermann, Jurgen; Etschenberg, Eugen; Friehe, Hugo; Scheef, Wolfgang; and Winkelmann, Johannes, 4,505,854, Cl. 260-112.50R.
Scheetz, Barry; Rizer, Janine M.; and Hahn, Michael, to Research One Limited Partnership. Cementitious composite material. 4,505,753, Cl. 106-90.000.
Schenectady Chemicals, Inc.: *See*—
Smith, Scott D., 4,505,978, Cl. 428-379.000.
Scheuerlein, Roy E.; and Ogura, Seiki, to International Business Machines Corporation. One-device random access memory having enhanced sense signal. 4,506,351, Cl. 365-205.000.
Scheurenberg, Helmut; and Funke, Manfred, to Losenhausen Maschinenbau AG. Hydrostatic travelling drive system with towing circuit. 4,505,355, Cl. 180-308.000.
Schick, Martin J.: *See*—
Lipowski, Stanley A.; Miskel, John J., Jr.; and Schick, Martin J., 4,505,833, Cl. 252-8.50C.
Schilling, Horst: *See*—
Herchenbach, Horst; Seelen, Fritz; Ramesohl, Hubert; Hundgen, Peter; and Schilling, Horst, 4,505,051, Cl. 34-57.00E.
Schiminski, Herbert: *See*—
Schippers, Heinz; Lenk, Erich; Turk, Herbert; and Schiminski, Herbert, 4,505,436, Cl. 242-43.00A.
Schippers, Heinz; Lenk, Erich; Turk, Herbert; and Schiminski, Herbert, 4,505,437, Cl. 242-43.00A.
Schippers, Heinz; Lenk, Erich; Turk, Herbert; and Schiminski, Herbert, to Barmag Barmer Maschinenfabrik AG. Yarn winding apparatus. 4,505,436, Cl. 242-43.00A.
Schippers, Heinz; Lenk, Erich; Turk, Herbert; and Schiminski, Herbert, to Barmag Barmer Maschinenfabrik AG. Apparatus for winding a plurality of yarns. 4,505,437, Cl. 242-43.00A.
Schirmag, Klaus-Peter: *See*—
Boos, Jurgen; Homersen, Achim; and Schirmag, Klaus-Peter, 4,505,692, Cl. 474-111.000.
Schirtzinger, Joseph F.: *See*—
Considine, Robert J.; Schirtzinger, Joseph F.; and Stiles, Kenneth M., 4,505,541, Cl. 350-96.230.
Schlanzke, Claus G.: *See*—
Beerens, Hugo; Feldmann, Hugo; Gipperich, Theodor; Kirchhoff, Hans; Kusel, Siegfried; Schlanzke, Claus G.; and Nobis, Dieter, 4,505,374, Cl. 198-448.000.
Schlegel, Brooke P.: *See*—
Detwiler, Richard L.; Schlegel, Brooke P.; and Kissel, Thomas R., 4,505,801, Cl. 204-418.000.
Schlumberger Technology Corporation: *See*—
Lee, Arley G., 4,506,219, Cl. 324-221.000.
Schmeichel, Charles M.: *See*—
Schmeichel, Steven C.; and Schmeichel, Charles M., 4,505,512, Cl. 296-98.000.
Schmeichel, Steven C.; and Schmeichel, Charles M. Roll-up tarp apparatus. 4,505,512, Cl. 296-98.000.
Schmelzer Corporation: *See*—
Heimnick, Paul, 4,505,237, Cl. 123-179.00G.
Schmidt, Helmut; Kaiser, Alfred; and Scholze, Horst, to Fraunhofer-Gesellschaft. Membranes based on silicic acid heteropolycondensates and a process for their production. 4,505,985, Cl. 428-447.000.
Schmidt, Paul W., to ESCO Corporation. Method and apparatus for quenching a torch-cut work-piece. 4,505,761, Cl. 148-9.00R.
Schmitt, Paul M., to GTE Communications Products Corporation. Message alert system. 4,506,115, Cl. 179-84.00C.
Schmitt, Robert F. System for conditioning air. 4,505,328, Cl. 165-53.000.
Schmitz, Peter. Structural panel. 4,505,082, Cl. 52-309.800.
Schnaibel, Eberhard: *See*—
Ackermann, Fritz; and Schnaibel, Eberhard, 4,505,368, Cl. 192-0.092.
Schneider, Bernhard; and Menges, Horst, to Rheinmetall GmbH. Stepwise double-cartridge-alternate feeder for an automatic weapon having a straight breech operation. 4,505,181, Cl. 89-33.040.
Schneider, Clayton E., Jr.: *See*—
Gulati, Surender K.; and Schneider, Clayton E., Jr., 4,506,165, Cl. 307-272.00A.
Schneider, Gernot: *See*—
Lienhard, Heinz; and Schneider, Gernot, 4,506,214, Cl. 324-117.00R.
Schneider, Gottfried: *See*—
Landwehrkamp, Hans; Schneider, Gottfried; and Pohn, Johann, 4,505,102, Cl. 57-408.000.
Schneider, Wesley. Liquid storage and delivery system for protective mask. 4,505,310, Cl. 141-114.000.
Schnoes, Heinrich K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Sicinski, Rafal R.; and Tanaka, Yoko, 4,505,906, Cl. 514-167.000.
Schoberth, Winfried: *See*—
Balle, Gerhard; Rasshofer, Werner; and Schoberth, Winfried, 4,506,039, Cl. 521-137.000.
Schoenberg, Jules E.; and Anderson, Stephen P., to National Starch and Chemical Corporation. Aromatic diamines. 4,506,100, Cl. 564-430.000.
Scholze, Dietrich: *See*—
Scholze, Gottfried; Scholze, Dietrich; and Maier, Johannes, 4,505,439, Cl. 242-68.400.
Scholze, Gottfried; Scholze, Dietrich; and Maier, Johannes, to Erich Scholze GmbH & Co. KG. Arrangement for the clamping of a warp beam tube or the like. 4,505,439, Cl. 242-68.400.
Scholze, Horst: *See*—
Schmidt, Helmut; Kaiser, Alfred; and Scholze, Horst, 4,505,985, Cl. 428-447.000.
Schrader, Wolfgang: *See*—
Hobbs, John; and Schrader, Wolfgang, 4,505,344, Cl. 177-136.000.
Schreckenberg, Manfred: *See*—
Medem, Harald; Schreckenberg, Manfred; Dhein, Rolf; Nouvertne, Werner; and Rudolph, Hans, 4,506,066, Cl. 528-196.000.

Schroeder, Albert H.: *See*—
Kurkov, Victor P.; Schroeder, Albert H.; Denisevich, Peter, Jr.; and Suzuki, Shigeto, 4,505,842, Cl. 252-500.000.
Suzuki, Shigeto; Kurkov, Victor P.; Schroeder, Albert H.; and Denisevich, Peter, Jr., 4,505,843, Cl. 252-500.000.

Schubert, Hermann; and Thone, Heinrich, to Voest-Alpine Aktiengesellschaft. Horizontal continuous casting plant. 4,505,320, Cl. 164-440.000.

Schubert & Salzer: *See*—
Landwehrkamp, Hans; Schneider, Gottfried; and Pohn, Johann, 4,505,102, Cl. 57-408.000.

Schubler, Rainer: *See*—
Damson, Eckart; Moser, Winfried; Muller, Klaus; Rieger, Franz; and Schubler, Rainer, 4,506,186, Cl. 313-129.000.

Schuck, Jack K.; and Adams, Neal J., to Zimpro Inc. Multiple hearth furnace chamber. 4,505,210, Cl. 110-336.000.

Schuettenberg, Alexander D., to Phillips Petroleum Company. Fuel additives from borated, acid-treated mixtures of vegetable oil derived amides and esters. 4,505,725, Cl. 44-66.000.

Schukei, Glen E., to Combustion Engineering, Inc. Method of installing a tube sleeve. 4,505,017, Cl. 29-157.30R.

Schulte-Huermann, Werner: *See*—
Hemmerich, Heinz-Peter; Schulte-Huermann, Werner; and Dohm, Heinz, 4,506,103, Cl. 568-744.000.

Schultz, John C., to Houdaille Industries, Inc. Linear friction damped mechanism-return devices. 4,505,458, Cl. 267-9.00B.

Schurle, Hermann; Grimm, Wolfgang; and Bammert, Hubert, to Carl-Zeiss-Stiftung. Device for rapid demonstration of the action of phototropic objects. 4,505,683, Cl. 434-365.000.

Schurter, Rolf; and Rempfler, Hermann, to Ciba-Geigy Corporation. α-[4-(3-Fluoro-5'-halopyridyl-2'-oxy)-phenoxy]-propionic acid derivatives having herbicidal activity. 4,505,743, Cl. 71-94.000.

Schwabe, Ulrich; Neppl, Franz; Burker, Ulf; and Christoph, Werner, to Siemens Aktiengesellschaft. Method of making MOS device using metal silicides or polysilicon for gates and impurity source for active regions. 4,505,027, Cl. 29-577.00C.

Schwar, Rudolf, to Maschinenfabrik Ernst Thielenhaus GmbH. Crankshaft-finishing machine. 4,505,071, Cl. 51-3.000.

Schwartzman, Steven M.: *See*—
Ribi, Edgar E.; Schwartzman, Steven M.; and Cantrell, John L., 4,505,900, Cl. 514-2.000.

Schwarz, Alfred O., to AT&T Bell Laboratories. Precision fusing arrangement. 4,506,310, Cl. 361-104.000.

Schwarzberger, Michael, to ABM Industries, Inc. Shape forming and quilting apparatus. 4,505,212, Cl. 112-118.000.

Schweppe, Manfred: *See*—
Aigner, Heinrich; Merget, Norbert; Norden, Jurgen; Schweppe, Manfred; and Wetter, Klaus, 4,505,732, Cl. 71-11.000.

SCI Systems, Inc.: *See*—
Coe, Ronald J., 4,506,274, Cl. 346-82.000.

Scire, Fredric E. Planar biaxial micropositioning stage. 4,506,154, Cl. 250-442.100.

Scobie, William B., to Keystone International, Inc. Valve seat assembly and valve. 4,505,290, Cl. 137-74.000.

Scott, Donald W. Reduced size heating assembly for an electric stove. 4,506,141, Cl. 219-463.000.

Scott, Douglas R.: *See*—
Frankenberg, Alfred A.; and Scott, Douglas R., 4,505,106, Cl. 60-286.000.

Scott, John H. Dog feeder. 4,505,228, Cl. 119-62.000.

Scott, Raymond G.; and Sherwood, Irvin W. Overwrapped window carton and blank. 4,505,384, Cl. 206-45.330.

Scripto, Inc.: *See*—
Lockwood, John C., 4,505,606, Cl. 401-55.000.

Sea-Log Corporation: *See*—
Considine, Robert J.; Schirtzinger, Joseph F.; and Stiles, Kenneth M., 4,505,541, Cl. 350-96.230.

Sealy, Incorporated: *See*—
Klancnik, Alvin R., 4,504,991, Cl. 5-459.000.

Sears, Stephan B.: *See*—
Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., 4,506,276, Cl. 346-140.00R.

Seddon, James; and Jones, Frank, to Dobson Park Industries PLC. Self-advancing mine roof supports. 4,505,517, Cl. 299-31.000.

Sedis Compagnie des Transmissions Mecaniques: *See*—
Kohler, Bernard, 4,505,691, Cl. 474-101.000.

Seedhouse, Frederick A.; and Green, Frederick A., to Xerox Corporation. Registration system for a photocopier. 4,505,581, Cl. 355-58.000.

Seelen, Fritz: *See*—
Herchenbach, Horst; Seelen, Fritz; Ramesohl, Hubert; Hundgen, Peter; and Schilling, Horst, 4,505,051, Cl. 34-57.00E.

Seidel, Hartmut; and Hammerschmidt, Winrich B., to NATEC Institut. Apparatus for making a one-piece, washable and sterilizable plastic shoe. 4,505,660, Cl. 425-129.00S.

Seiko Seiki Kabushiki Kaisha: *See*—
Kogure, Toshiharu, 4,505,074, Cl. 51-165.770.

Seki, Masaki: *See*—
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,506,331, Cl. 364-474.000.

Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, to Showa Denko Kabushiki Kaisha. Herbicidal 5-t-butyl-3-(N-alkanoylamino)pyrazoles. 4,505,739, Cl. 71-92.000.

Sekimura, Nobuyuki, to Canon Kabushiki Kaisha. Liquid crystal display device with reflection preventive function. 4,505,547, Cl. 350-339.00R.

Sekine, Masao: *See*—
Hasegawa, Shin-ich; Takano, Eiji; and Sekine, Masao, 4,505,882, Cl. 423-261.000.

Sekiya, Hideshi: *See*—
Nameda, Naoyoshi; Surisawa, Yooji; Nakamoto, Yasunobu; and Sekiya, Hideshi, 4,505,263, Cl. 126-438.000.

Sekiya, Hiroshi: *See*—
Kawate, Keiichi; and Sekiya, Hiroshi, 4,505,024, Cl. 29-571.000.

Selenke, William M. Tissue grinding and transporting device. 4,505,433, Cl. 241-46.00R.

Semiconductor Research Foundation: *See*—
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,506,281, Cl. 357-43.000.

Senaratne, Gane W., to Airtec Industries. Vacuum device for lifting an article loosely wrapped in flexible film. 4,505,505, Cl. 294-64.100.

Sendzimir Engineering Corporation: *See*—
Sendzimir, Tadeusz; and Gajda, Jacek Z., 4,505,438, Cl. 242-55.000.

Sendzimir, Tadeusz; and Gajda, Jacek Z., to Sendzimir Engineering Corporation. Single coil accumulator. 4,505,438, Cl. 242-55.000.

Seppanen, Olli; Punttila, Antero; and Sulku, Jukka, to Ekono, Inc. Heat regulation system and method for building structure. 4,505,259, Cl. 126-429.000.

Serov, Petr G.: *See*—
Makarov, Viktor M.; Paton, Boris E.; Globin, Nikolai K.; Usenko, Viktor G.; Khismatulin, Enver R.; Ziselman, Boris G.; Serov, Petr G.; Shel, Marat M.; and Rozenberg, Ovshiya O., 4,505,417, Cl. 228-17.700.

Seto, Susumu; and Toriumi, Akihiko, to Canon Kabushiki Kaisha. Projection apparatus which compensates for the spectral sensitivity of an image receiving member. 4,505,569, Cl. 355-3.00R.

Seto, Yoshihiro, to Fuji Photo Film Co., Ltd. Roll package. 4,505,387, Cl. 206-414.000.

Sewards, George R., to Linear Limited. Joining weatherstrippings. 4,505,780, Cl. 156-507.000.

Seymour, Stephen R.; Guy, Robert K.; and Roberts, Paul N., to Rolls-Royce Limited. Sensing surges in gas turbine engines. 4,505,150, Cl. 73-116.000.

Sgandurra, Vicente. Scoliosis frame. 4,505,268, Cl. 128-69.000.

Shaffer, David T.: *See*—
Rose, William H.; Rupnik, David W.; and Shaffer, David T., 4,506,124, Cl. 200-153.00J.

Shafii-Rad-G., Nader. Drawing aid with interchangeable insert. 4,505,044, Cl. 33-174.00B.

Shah, Saresh: *See*—
Marks, Robert E.; Burton, James S.; Elvidge, John A.; and Shah, Saresh, 4,505,898, Cl. 514-18.000.

Shaheen, Louis R. Wall support. 4,505,447, Cl. 248-216.100.

Shannon, John K. Cable connector and method. 4,505,534, Cl. 339-263.00R.

Shannon, John M., to U.S. Philips Corporation. Electron sources and equipment having electron sources. 4,506,284, Cl. 357-52.000.

Sharp, Harper E., to Wilson Industries, Inc. Borehole survey instrument. 4,505,048, Cl. 33-313.000.

Sharp Kabushiki Kaisha: *See*—
Hamada, Hiroshi; Take, Hiroshi; Yano, Kozo; and Inami, Yasuhiko, 4,505,021, Cl. 29-570.000.

Shaw, Philip S.; Sordi, Joseph J.; and Traiger, Irving L., to International Business Machines Corporation. Apparatus and method for synthesizing a query for accessing a relational data base. 4,506,326, Cl. 364-300.000.

Sheesley, Gary; and Grudzinski, Michael, to Empire Abrasive Equipment Corporation. Cabinet door interlock. 4,505,077, Cl. 51-415.000.

Sheibley, Dean W.: *See*—
Hsu, Li-Chen; Philipp, Warren H.; Sheibley, Dean W.; and Gonzalez-Sanabria, Olga D., 4,505,998, Cl. 429-206.000.

Sheinaus, Harold; and Marcus, Arnold D., to Bristol-Myers Company. Diphenydramine dihydrogencitrate. 4,505,862, Cl. 260-501.180.

Shel, Marat M.: *See*—
Makarov, Viktor M.; Paton, Boris E.; Globin, Nikolai K.; Usenko, Viktor G.; Khismatulin, Enver R.; Ziselman, Boris G.; Serov, Petr G.; Shel, Marat M.; and Rozenberg, Ovshiya O., 4,505,417, Cl. 228-17.700.

Shell California Production Inc.: *See*—
Leech, Charles A., III; Rancudo, Thomas J., Jr.; and Groman, James W., 4,505,297, Cl. 137-561.00A.

Shell Oil Company: *See*—
Diaz, Zaida, 4,505,881, Cl. 423-236.000.
Sanborn, James R., 4,505,904, Cl. 514-112.000.

Shelley, George W., Jr., to Allis-Chalmers Corporation. Air admission apparatus for water control gate. 4,505,612, Cl. 405-101.000.

Shelton, L. C., Jr. Gas treating apparatus and process. 4,505,722, Cl. 55-89.000.

Shelton, Robert H. Hydrocarbon fuel recovery. 4,505,516, Cl. 299-2.000.

Shenberger, Paul S.; Walker, James D.; and Campbell, Willis R., to Sperry Corporation. Twine cut and clamp mechanism for a roll baling machine. 4,505,197, Cl. 100-5.000.

Sherif, Fawzy G.; and Michaels, Edwin S., to Stauffer Chemical Company. Fast-setting cements from solid phosphorus pentoxide containing materials. 4,505,752, Cl. 106-85.000.

Sherman, Richard W. Radiator air intake filtering system. 4,505,330, Cl. 165-119.000.

Sherritt Gordon Mines Limited: *See*—
Weir, Donald R.; Masters, Ian M.; and Bolton, Gerald L., 4,505,744, Cl. 75-120.000.

Sherwood, Irvin W.: *See*—
Scott, Raymond G.; and Sherwood, Irvin W., 4,505,384, Cl. 206-45.330.
Shibata, Akiyoshi: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikazu; Kawata, Toshikatsu; Kiboshi, Shinzi; and Shibata, Akiyoshi, 4,506,053, Cl. 524-405.000.
Shigemura, Yutaka: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; and Shigemura, Yutaka, 4,505,571, Cl. 355-3.0SH.
Shikishima Tipton Manufacturing Co., Ltd.: *See*—
Kobayashi, Hisamine; and Ishihara, Toshiro, 4,505,072, Cl. 51-164.200.
Shimada, Masayoshi; Komagata, Hideki; and Iizuka, Yasuhiro, to Toyo Boseki Kabushiki Kaisha. Metal-halogen secondary battery. 4,505,994, Cl. 429-101.000.
Shimada, Takanobu: *See*—
Hasegawa, Takanori; and Shimada, Takanobu, 4,505,199, Cl. 101-127.100.
Shimidzu, Yasutaka; Kenmochi, Hirohito; Ueno, Toshihiko; and Tani, Chizuka, to Sumitomo Chemical Company, Limited; and Nippon Electric Co., Ltd. Liquid crystal display device. 4,505,549, Cl. 350-349.000.
Shimizu, Kazuyuki: *See*—
Endo, Yoichi; Nakanishi, Kazuo; Namura, Hideki; Doi, Terukazu; Kusumoto, Katsunori; Shimizu, Kazuyuki; Yoshimi, Kazuhiko; Nagai, Shigeru; and Sato, Shoichi, 4,505,217, Cl. 114-103.000.
Shimizu, Tasuku: *See*—
Sugihara, Isao; Sagawa, Wataru; Ikegami, Tsukasa; and Shimizu, Tasuku, 4,505,763, Cl. 148-127.000.
Shimoda, Naokazu: *See*—
Hasegawa, Yuzo; and Shimoda, Naokazu, 4,505,605, Cl. 400-208.000.
Shinmi, Akira: *See*—
Sawada, Takeshi; Yoneda, Kou; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, 4,506,220, Cl. 324-252.000.
Shinoda, Akibumi; Yoshioka, Yukio; and Kato, Akio, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Load lifting unit for a lift truck. 4,505,635, Cl. 414-667.000.
Shinoda, Kazuo; Miyaki, Masahiko; Masuda, Akira; and Koide, Hiroshi, to Toyota Jidosha Kabushiki Kaisha; and Nippondenso Co., Ltd. Fuel injection pump of the distributor type. 4,505,240, Cl. 123-357.000.
Shinohara, Toshio: *See*—
Hokamura, Sadakazu; Shinohara, Toshio; Nomura, Ryoichi; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,505,954, Cl. 427-380.000.
Shinozuka, Kiyoshi; Otu, Koichi; and Fukumoto, Hiroshi, to Onahama Sakai Kagaku Kabushiki Kaisha. Method of producing surface-treated barium sulfate. 4,505,755, Cl. 106-308.00B.
Shionogi & Co., Ltd.: *See*—
Sakai, Makiko, 4,506,079, Cl. 548-503.000.
Shiozaki, Shigeru: *See*—
Adachi, Tomio; Shiozaki, Shigeru; and Tomie, Takashi, 4,505,966, Cl. 428-141.000.
Shipp, Kenneth O., Jr.; Wood, Richard B.; and Repass, James T., to International Business Machines Corporation. Column layout reference area display management. 4,506,343, Cl. 364-900.000.
Shiraishi, Yasuhiro: *See*—
Noso, Kazunori; Kishi, Norimasa; Futami, Toru; Nomura, Hiroyuki; and Shiraishi, Yasuhiro, 4,506,378, Cl. 381-43.000.
Shirakami, Toshiaki, to Kokusai Denshin Denwa Kabushiki Kaisha. Chroma-key signal generator. 4,506,289, Cl. 358-22.000.
Shizuka, Masayuki; Ogasawara, Nobuhiko; Kanamaru, Hisanobu; and Tsuruoka, Kazuhiro, to Hitachi, Ltd. Fixed field inductor-type generator. 4,506,180, Cl. 310-91.000.
Shonka, Leonard G., to Systems and Methods, Inc. Pre-press make-ready scale for rotary presses. 4,505,046, Cl. 33-184.500.
Shores, David H.; and Whiting, Mark, to Tektronix, Inc. Magnet assembly for a YIG tuned filter having adjustment means to elastically strain a pole piece. 4,506,240, Cl. 333-202.000.
Short, Henry A., Sr. Hoop adapter assembly for powered lawn mower. 4,505,095, Cl. 56-202.000.
Showa Denko Kabushiki Kaisha: *See*—
Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,505,739, Cl. 71-92.000.
Sicinski, Rafal R.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Sicinski, Rafal R.; and Tanaka, Yoko, 4,505,906, Cl. 514-167.000.
Siddall, Graham J., to Varian Associates, Inc. Deformable chuck driven by piezoelectric means. 4,506,184, Cl. 310-328.000.
Sidhwa, Feroze J., to Mobil Oil Corporation. Data transmission system for logging tools. 4,506,263, Cl. 340-856.000.
Sielaff, Ulrich. Voice communicator. 4,505,358, Cl. 181-18.000.
Siemens Aktiengesellschaft: *See*—
Auracher, Franz; Buerk, Hermann; Keil, Rudolf; Stockmann, Michael; Weingand, Kaspar; and Zeitler, Karl-Heinz, 4,505,539, Cl. 350-96.150.
Barre, Claude, 4,506,363, Cl. 371-15.000.
Einzinger, Richard, 4,506,285, Cl. 357-80.000.
Falckenberg, Richard; Foell, Helmut; and Grabmaier, Josef, 4,505,221, Cl. 118-101.000.
Hildebrand, Reinhard; and Waldmann, Bernd, 4,505,324, Cl. 165-42.000.
Koroncai, Adam I.; and Poetsch, Edmund R., 4,506,320, Cl. 363-141.000.
Mund, Konrad; Luft, Gunter; and Gebhardt, Ulrich, 4,505,784, Cl. 204-1.00T.
Schwabe, Ulrich; Neppl, Franz; Burker, Ulf; and Christoph, Werner, 4,505,027, Cl. 29-577.00C.
Stocki, Klaus; and Engert, Reinhard, 4,505,514, Cl. 297-322.000.
Trommer, Reiner, 4,505,765, Cl. 148-171.000.
Vite, Lutz; and Mews, Hannelore, 4,505,883, Cl. 423-335.000.
Siemens Aktiengsellschaft: *See*—
Krause, Norbert, 4,506,224, Cl. 324-319.000.
Siemens Katiengesellschaft: *See*—
Keller, Wolfgang, 4,506,132, Cl. 219-10.790.
Siepmann, Walter, to Siepmann-Werke GmbH & Co. KG. Check valve. 4,505,454, Cl. 251-367.000.
Siepmann-Werke GmbH & Co. KG: *See*—
Siepmann, Walter, 4,505,454, Cl. 251-367.000.
SIG Schweizerische Industrie-Gesellschaft: *See*—
Auckenthaler, Robert, 4,505,769, Cl. 156-217.000.
SIG Swiss Industrial Company: *See*—
Datwyler, Walter; and Meister, Leo, 4,506,200, Cl. 318-493.000.
Silverio, Vincent J.: *See*—
Bennett, Joseph M.; Gordon, Alan M.; Silverio, Vincent J.; and Zydney, Herbert M., 4,506,346, Cl. 364-900.000.
Silvestrini, Jesus A.; and Morsucci, Juan C., to Imdec S.R.L. Apparatus for moving and thermally conditioning cylindrical containers. 4,505,670, Cl. 432-124.000.
Simazaki, Yuzuru: *See*—
Umeda, Takao; Simazaki, Yuzuru; Igawa, Tatsuo; Tanno, Seikichi; Sasaki, Ken; and Miyashita, Takao, 4,505,546, Cl. 350-334.000.
Simeri, Albert R.; and Simeri, Paul S., to Van Express, Inc. Removable van bench. 4,505,509, Cl. 296-63.000.
Simeri, Paul S.: *See*—
Simeri, Albert R.; and Simeri, Paul S., 4,505,509, Cl. 296-63.000.
Simizu, Nobuo: *See*—
Tomiyori, Takashi; Fukuda, Misao; Yamashita, Iwao; Simizu, Nobuo; and Kumano, Takeshi, 4,505,073, Cl. 51-165.00R.
Simmons, Roy, to Rolls-Royce Limited. Turbine overspeed limiter for turbomachines. 4,505,104, Cl. 60-39.091.
Simonton, Robert D. Primary flat cell. 4,505,996, Cl. 429-162.000.
Singer Company, The: *See*—
Killinger, Karl H., 4,505,213, Cl. 112-315.000.
Singh, Baldev: *See*—
Lesher, George Y.; and Singh, Baldev, 4,506,075, Cl. 546-329.000.
Singh, Rajendra K., to Monsanto Co. Tetra-N-substituted urea derivatives as herbicides. 4,505,735, Cl. 71-086.000.
Sirac S.p.A.: *See*—
Filippini, Andrea; and Carobbi, Renato, 4,506,036, Cl. 521-53.000.
SKF Kugellagerfabriken GmbH: *See*—
Muller, Leo; Koder, Walter; Brandenstein, Manfred; Walter, Lothar; Edelmann, Ludwig; Bonengel, Roland; and Haas, Roland, 4,505,369, Cl. 192-98.000.
Skinner, Neal G., to Halliburton Company. Battery housing. 4,505,993, Cl. 429-100.000.
Skovrinski, Adam L.: *See*—
Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gordhanbhai N.; Poncha, Rustom P.; Skovrinski, Adam L.; and Lesco, James M., 4,505,786, Cl. 204-38.400.
Skrycki, Andrew R., to Ex-Cell-O Corporation. Mechanical fastener for intake manifold gasket. 4,505,486, Cl. 277-235.00B.
Slater Electric, Inc.: *See*—
Bowden, Wade R., Jr.; and Herzfeld, David, 4,505,403, Cl. 220-242.000.
Smagner, John D. Trap boot. 4,505,064, Cl. 43-96.000.
Smallegan, Jon M., to Multifastener Corporation. Fastener installation apparatus. 4,505,416, Cl. 227-120.000.
Smart, William L.: *See*—
Woodruff, Frederick W.; Hughey, Daniel C.; and Smart, William L., 4,506,260, Cl. 340-649.000.
Smets, Jacques; and Laurent, Michel, to Glaverbel. Glazing panels and their bonding. 4,506,125, Cl. 219-10.530.
Smets, Jacques; and Laurent, Michel, to Glaverbel. Method and apparatus for bonding glazing panels. 4,506,126, Cl. 219-10.530.
Smickley, Robert J.; and Dardi, Louis E., to Howmet Turbine Components Corporation. Microstructural refinement of cast titanium. 4,505,764, Cl. 148-133.000.
Smirnov, Boris A.: *See*—
Utyamyshev, Rustam I.; Smirnov, Boris A.; Kanshin, Nikolai N.; Korolkov, Ivan A.; and Ivanova, Tatyana L., 4,505,272, Cl. 128-305.000.
Smith, Arthur J. Carburetor. 4,505,863, Cl. 261-34.00A.
Smith, Edward D., to Cummins Engine Company, Inc. Fuel injection system. 4,505,244, Cl. 123-447.000.
Smith International Inc.: *See*—
Horton, Roger L., 4,505,826, Cl. 252-8.55R.
Smith, Monte E.: *See*—
Pusic, Vladi; George, Benjamin T.; Smith, Monte E.; and Johnson, Craig B., 4,506,323, Cl. 364-200.000.
Smith, Scott D., to Schenectady Chemicals, Inc. Bondable polyamide. 4,505,978, Cl. 428-379.000.
Smithers-Oasis Company: *See*—
Roder, Manfred, 4,505,446, Cl. 248-205.800.
SmithKline Beckman Corporation: *See*—
Menon, Govind K.; and Sanders, Winfred J., 4,505,917, Cl. 514-347.000.

SMS Schloemann-Siemag Aktiengesellschaft: *See—*
Beerens, Hugo; Feldmann, Hugo; Gipperich, Theodor; Kirchhoff, Hans; Kusel, Siegfried; Schlanzke, Claus G.; and Nobis, Dieter, 4,505,374, Cl. 198-448.000.

Smyth, Richard T.; and Zatorski, Raymond A., to Metco, Inc. Plasma spray gun having a gas vortex producing nozzle. 4,506,136, Cl. 219-121.0PL.

Snow, William E.: *See—*
Burton, William H.; and Snow, William E., 4,505,035, Cl. 29-843.000.

Societe Anonyme D.B.A.: *See—*
Muterel, Roland, 4,505,519, Cl. 303-6.00A.

Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques: *See—*
Lhonore, Pierre; Quibel, Jacques; Jacquinot, Bernard; Jestin, Yvon; and Pelletier, Robert, 4,505,879, Cl. 422-197.000.

Societe Civile Professionnelle Gazzano & Blais: *See—*
De Brossard, Philippe, 4,504,985, Cl. 4-506.000.

Societe Europeenne des Produits Refractaires: *See—*
Guigonis, Jacques, 4,506,023, Cl. 501-104.000.

Societe Francaise d'Etudes d'Installations Siderurgiques SOFRESID: *See—*
Andrier, Bernard, 4,505,620, Cl. 405-224.000.

Societe Nationale Elf Aquitaine: *See—*
Armand, Michel B.; and El Kadiri Cherkaoui el Moursli, Fouzia, 4,505,997, Cl. 429-192.000.

Soclof, Sidney I., to Rockwell International Corporation. Small area high value resistor with greatly reduced parasitic capacitance. 4,506,283, Cl. 357-51.000.

Soderberg, John H.: *See—*
Duwel, Edward C.; and Soderberg, John H., 4,506,329, Cl. 364-464.000.

Soejima, Shigeo: *See—*
Mase, Syunzo; and Soejima, Shigeo, 4,505,783, Cl. 204-1.00T.
Mase, Syunzo; and Soejima, Shigeo, 4,505,790, Cl. 204-130.000.
Mase, Syunzo; and Soejima, Shigeo, 4,505,802, Cl. 204-425.000.
Mase, Syunzo; and Soejima, Shigeo, 4,505,803, Cl. 204-425.000.
Mase, Syunzo; and Soejima, Shigeo, 4,505,804, Cl. 204-425.000.
Mase, Syunzo; and Soejima, Shigeo, 4,505,805, Cl. 204-425.000.

Solomon, Jack, to Esselte Pendaflex Corporation. Expandable portable file. 4,505,388, Cl. 206-425.000.

Solow, Joseph E., to Wolo Manufacturing Corporation. Automobile security device for steering column ignition locks. 4,505,140, Cl. 70-424.000.

Sone, Junichi, to Nippon Electric Co., Ltd. Pulse generation circuit using at least one Josephson junction device. 4,506,166, Cl. 307-277.000.

Sonoda, Hiroyoshi: *See—*
Kurushima, Tadanori; Hidaka, Hideo; and Sonoda, Hiroyoshi, 4,505,101, Cl. 57-301.000.

Sony Corporation: *See—*
Kubota, Isao; Kobayashi, Kunio; and Miyao, Toshimi, 4,506,000, Cl. 430-39.000.
Majima, Osamu, 4,505,975, Cl. 428-336.000.
Nagumo, Fumio, 4,506,294, Cl. 358-50.000.
Tajima, Shigeru; Okada, Hiroshi; and Nakano, Kenji, 4,506,202, Cl. 318-603.000.

Sood, Raman R.: *See—*
Huni, Jean-Paul R.; Hollingshead, Ethan A.; Edgeworth, Thomas G.; Sood, Raman R.; Dewing, Ernest W.; and Rogers, Charles J., 4,505,796, Cl. 204-243.00R.

SOQUIP: *See—*
Pronovost, Richard; Innis, Peter; and O'Rourke, Leo M., 4,505,127, Cl. 62-271.000.

Sorathia, Usman A. K.: *See—*
Gagliani, John; Sorathia, Usman A. K.; and Lee, Raymond, 4,506,038, Cl. 521-103.000.

Sordi, Joseph J.: *See—*
Shaw, Philip S.; Sordi, Joseph J.; and Traiger, Irving L., 4,506,326, Cl. 364-300.000.

Souders, Roger B. Weighted bat with weight securing means. 4,505,479, Cl. 273-72.00A.

Sound Products Company L.P.: *See—*
Questo, Warren O., 4,505,156, Cl. 73-626.000.

Southern California Edison: *See—*
Mansour, Mansour N., 4,505,665, Cl. 431-10.000.

Specie, Roy L. Dolly system for campgrounds. 4,505,489, Cl. 280-47.13R.

Speedy Automatic Chimney Sweep, Inc.: *See—*
Boehland, Burnell G.; and Coutts, Donald G., 4,505,000, Cl. 15-249.000.

Speelman, Irving A., to Propper Manufacturing Co., Inc. Suture clip. 4,505,274, Cl. 128-337.000.

Speranza, George P.: *See—*
Brennan, Michael E.; and Speranza, George P., 4,506,090, Cl. 560-91.000.

Sperry Corporation: *See—*
Bennett, Donald B.; and Esch, John W., 4,506,325, Cl. 364-200.000.
Butler, L. Dennis, 4,505,633, Cl. 414-528.000.
Campbell, Steven J.; Stickley, Keith A.; and Klingensmith, David R., 4,505,279, Cl. 130-27.00T.
Cloke, Robert L., 4,506,236, Cl. 333-19.000.
Jacoby, George V.; and Cohn, Martin, 4,506,252, Cl. 340-347.0DD.
Kersch, Dennis R.; and Mitchell, Don E., 4,506,108, Cl. 174-52.0FP.
Martenas, Wayne B.; and Priepke, Edward H., 4,505,434, Cl. 241-89.300.
Pusic, Vladi; George, Benjamin T.; Smith, Monte E.; and Johnson, Craig B., 4,506,322, Cl. 364-200.000.
Shenberger, Paul S.; Walker, James D.; and Campbell, Willis R., 4,505,197, Cl. 100-5.000.

Sperry-Sun, Inc.: *See—*
Jackson, Joshua M., 4,505,155, Cl. 73-151.000.

Spica S.p.A.: *See—*
Nierga, Manuel R., 4,505,247, Cl. 123-500.000.

Spieker, David A.: *See—*
Neet, Thomas E.; and Spieker, David A., 4,505,973, Cl. 428-317.900.

Spitz, Melvin P., to Bedline Manufacturing Company. Mattress support mechanism for folding sofa-bed. 4,504,987, Cl. 5-13.000.

Spraco, Inc.: *See—*
Huffman, David C., 4,505,431, Cl. 239-428.000.

Sprinkle, Robert S., III: *See—*
Cogbill, Everett C.; and Sprinkle, Robert S., III, 4,505,282, Cl. 131-334.000.

Square D Company: *See—*
Wong, Tak M., 4,506,246, Cl. 335-164.000.

Staehli, Urs, to Rieter Machine Works Limited. Grating arrangement for an opening roller for fibers. 4,505,005, Cl. 19-200.000.

Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, to Hoechst Aktiengesellschaft. Polyol pre-mixture for making flame-retardant poly-urethane foam plastics. 4,505,849, Cl. 252-609.000.

Staheli, Werner: *See—*
Meier, Hans; and Staheli, Werner, 4,505,186, Cl. 92-5.00R.

Stahle, Helmut: *See—*
Kummer, Werner; Koppe, Herbert; Stahle, Helmut; Reichl, Richard; and Kuhn, Franz J., 4,505,912, Cl. 514-236.000.

Stamp, David L.: *See—*
Thiele, Gerald H.; and Stamp, David L., 4,505,737, Cl. 71-86.000.

Stamps, Kenneth H.: *See—*
Bishop, Charles D.; Powell, Joe R.; Stamps, Kenneth H.; and Watson, Clifford A., 4,505,194, Cl. 99-336.000.

Stanadyne, Inc.: *See—*
Vigh, James A., 4,504,986, Cl. 4-633.000.

Standard Car Truck Company: *See—*
Powell, Patrick L., 4,506,147, Cl. 235-95.00B.

Standard Oil Company, The: *See—*
Hunt, Patricia K.; and Waisala, Steven J., 4,505,161, Cl. 73-863.000.

Standard Oil Company (Indiana): *See—*
Fields, Ellis K., 4,506,093, Cl. 560-117.000.
Walker, Donald C.; and Ginsburgh, Irwin, 4,505,308, Cl. 141-59.000.

Standard Oil Company (Ohio), The: *See—*
Vukanovic, Vladimir; Butler, Susannah M.; Fazekas, George; and Miller, John R., 4,505,947, Cl. 427-34.000.

Statkus, George M., to Rockwell International Corporation. Conveyor pocket gripping apparatus. 4,505,378, Cl. 198-710.000.

Stauffer Chemical Company: *See—*
Band, Elliot I., 4,506,029, Cl. 502-111.000.
Chin, Hsiao-Ling M., 4,506,088, Cl. 560-12.000.
Goodman, Nelson; and Cunningham, Brian C., 4,506,010, Cl. 435-32.000.
Sherif, Fawzy G.; and Michaels, Edwin S., 4,505,752, Cl. 106-85.000.
Thiele, Gerald H.; and Stamp, David L., 4,505,737, Cl. 71-86.000.

Steeb, Dieter. Method for the manufacture of a heat-exchanger having at least one curved tube of flat cross-section. 4,505,419, Cl. 228-183.000.

Steer, David C.: *See—*
Cox, Roger B.; and Steer, David C., 4,506,044, Cl. 524-27.000.

Stein Associates, Inc.: *See—*
Miller, Michael E.; and Fetzer, Fred, 4,505,593, Cl. 366-152.000.

Stein Industrie: *See—*
Nguyen-Thanh, Thong, 4,505,329, Cl. 165-81.000.

Stein, Leonard, deceased: *See—*
Owyang, King; and Stein, Leonard, deceased, 4,505,029, Cl. 29-589.000.

Stein, Vera, executrix: *See—*
Owyang, King; and Stein, Leonard, deceased, 4,505,029, Cl. 29-589.000.

Steinbruegge, Kenneth B., to Westinghouse Electric Corp. Infrared acousto-optic tunable filter. 4,505,550, Cl. 350-372.000.

Steiner, Peter: *See—*
Bukoschek, Romuald L.; and Steiner, Peter, 4,506,178, Cl. 310-41.000.

Stelling, Horst: *See—*
Heinen, Raymond; and Stelling, Horst, 4,506,227, Cl. 328-33.000.

Stelzer, Gary J.; and Harmon, Calvin, III, to Goodyear Tire & Rubber Company, The. Composite rubber-urethane tank track pads to improve service life. 4,505,984, Cl. 428-424.700.

Stephan, Gerard, to Nadella. Prestressed rolling bearing device. 4,505,523, Cl. 384-445.000.

Stephens, Charles E.: *See—*
Clipp, James L.; and Stephens, Charles E., 4,505,070, Cl. 49-83.000.

Steppan, Hartmut: *See—*
Ruckert, Hans; Buhr, Gerhard; and Steppan, Hartmut, 4,506,003, Cl. 430-270.000.

Sterlin, Vladimir N.: *See—*
Lykov, Mikhail V.; Lembrikov, Vladimir M.; Golovkina, Svetlana I.; Malakhova, Nadezhda N.; Sterlin, Vladimir N.; Kochetkov, Viktor N.; and Markovin, Gennady M., 4,505,733, Cl. 71-34.000.

Sterling Drug Inc.: *See*—
Lesher, George Y.; and Singh, Baldev, 4,506,075, Cl. 546-329.000.
Stern, Eric W.: *See*—
Amundsen, Alan R.; and Stern, Eric W., 4,505,928, Cl. 514-492.000.
Stevens, Charles O., II: *See*—
Green, Donald R., Jr.; and Stevens, Charles O., II, 4,506,231, Cl. 330-129.000.
Stevens, Julius J., to Teledyne Industries, Inc. Starter motor housing. 4,506,163, Cl. 290-38.00R.
Stickley, Keith A.: *See*—
Campbell, Steven J.; Stickley, Keith A.; and Klingensmith, David R., 4,505,279, Cl. 130-27.00T.
Stigter, Jan, to IHC Holland N.V. Split hopper vessel. 4,505,215, Cl. 114-29.000.
Stiles, Kenneth M.: *See*—
Considine, Robert J.; Schirtzinger, Joseph F.; and Stiles, Kenneth M., 4,505,541, Cl. 350-96.230.
Stockburger, Hermann; and Bauer, Siegfried. Device for feeding data supports in a processing arrangement. 4,505,471, Cl. 271-251.000.
Stocker, Raymond, to Ford Motor Company. Throttle valve linkage adjustment gauge and method therefor. 4,505,045, Cl. 33-181.0AT.
Stockl, Klaus; and Engert, Reinhard, to Siemens Aktiengesellschaft. Chair for dental patients. 4,505,514, Cl. 297-322.000.
Stockmann, Michael: *See*—
Auracher, Franz; Buerk, Hermann; Keil, Rudolf; Stockmann, Michael; Weingand, Kaspar; and Zeitler, Karl-Heinz, 4,505,539, Cl. 350-96.150.
Stockton, Thomas R., to Ford Motor Company. Drive system for automotive power steering pump. 4,505,350, Cl. 180-143.000.
Stoffel, James C.: *See*—
Kingsley, William; Stoffel, James C.; Moreland, John F., Jr.; Matteson, Ronald G.; Wiggins, Douglas G.; and Allis, Robert F., 4,506,301, Cl. 358-280.000.
Stoll, Martin. Cutting segment with porous center section. 4,505,251, Cl. 125-15.000.
Stoner, Graham A.: *See*—
Freedenthal, Carol B.; Meyers, Marion D.; and Stoner, Graham A., 4,505,734, Cl. 71-67.000.
Stong, Linda J.: *See*—
Nix, Paul T.; Goldfarb, Rebecca D.; Stong, Linda J.; Sulick, Lorraine E.; Trivedi, Ramesh C.; and Morgenstern, Stanley W., 4,505,756, Cl. 127-29.000.
Strange, Victor E., to BL Technology Limited. Fluid flow control valve. 4,505,293, Cl. 137-117.000.
Straubel, Max, to Robert Bosch GmbH. Control apparatus for internal combustion engines. 4,505,242, Cl. 123-383.000.
Streatfield, Roy; and Wilson, Francis D., to British Gas Corporation. Replacement of mains. 4,505,302, Cl. 138-97.000.
Strietzel, Rainer: *See*—
Berthold, Rainer; and Strietzel, Rainer, 4,506,148, Cl. 235-380.000.
Strohmeyer, Charles, Jr., to Electrodyne Research Corporation. Unfired drying and sorting apparatus for preparation of solid fuel. 4,505,209, Cl. 110-245.000.
Sturm, Michael: *See*—
Kirsch, Jerome; Kopsco, M. Alan; Markow, Edward; and Sturm, Michael, 4,505,441, Cl. 244-3.150.
Kirsch, Jerome; Kopsco, M. Alan; Markow, Edward; and Sturm, Michael, 4,505,442, Cl. 244-3.150.
Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Martin, Hans, 4,505,367, Cl. 192-58.00B.
Sueyoshi, Masahiko: *See*—
Fukamachi, Masaaki; and Sueyoshi, Masahiko, 4,506,216, Cl. 324-166.000.
Suganuma, Tsuneo: *See*—
Matsumura, Hiroyoshi; Katsuyama, Toshio; and Suganuma, Tsuneo, 4,505,729, Cl. 65-3.110.
Sugawara, Shuji: *See*—
Mizuno, Masataka; Ito, Tatsuo; Sugawara, Shuji; Moriyama, Masakazu; Muto, Masahito; and Nakane, Shuji, 4,506,266, Cl. 343-715.000.
Sugawara, Takeshi: *See*—
Urano, Shigeru; Yamamoto, Kiyoshi; Takagi, Yoshiaki; and Sugawara, Takeshi, 4,505,988, Cl. 428-569.000.
Sugawara, Toru; and Ito, Yasuyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Ion source apparatus. 4,506,160, Cl. 250-427.000.
Sugihara, Isao; Sagawa, Wataru; Ikegami, Tsukasa; and Shimizu, Tasuku, to Hitachi, Ltd. Heat-treating method of weld portion of piping system and heating coil for the heat treatment. 4,505,763, Cl. 148-127.000.
Sugimoto, Tadao; and Ikeda, Hideo, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive materials. 4,506,008, Cl. 430-502.000.
Sugino, Kenji; and Nagata, Yukiaki, to Sugino Machine Limited. Underwater hydraulic motor. 4,505,638, Cl. 415-113.000.
Sugino Machine Limited: *See*—
Sugino, Kenji; and Nagata, Yukiaki, 4,505,638, Cl. 415-113.000.
Sugino, Yoshihide; Tsumura, Takashi; Nakamura, Junnosuke; and Yamaki, Kazuyoshi, to Yamatake Honeywell Co., Ltd. Robot machines. 4,505,636, Cl. 414-736.000.
Sugiura, Susumu; Sato, Tadashi; and Nakajima, Norio, to Canon Kabushiki Kaisha. System for storage and printing a plurality of images. 4,505,576, Cl. 355-14.00R.
Sugiyama, Takashi, to Yoshida Industry Co., Ltd. Retractable-type cosmetic container with removable base. 4,505,607, Cl. 401-78.000.
Suh, John T.: *See*—
Loev, Bernard; Jones, Howard; and Suh, John T., 4,505,920, Cl. 514-341.000.
Sujaku, Takamichi; Aoyama, Shuki; and Fukasawa, Takaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Microwave oven having specially-positioned electric components. 4,506,128, Cl. 219-10.55F.
Sukekawa, Masayuki: *See*—
Usami, Kenichi; Kirihara, Seishin; Doi, Hiroyuki; Asano, Choichi; Sukekawa, Masayuki; and Sakaguchi, Yasuhide, 4,505,232, Cl. 122-511.000.
Sulick, Lorraine E.: *See*—
Nix, Paul T.; Goldfarb, Rebecca D.; Stong, Linda J.; Sulick, Lorraine E.; Trivedi, Ramesh C.; and Morgenstern, Stanley W., 4,505,756, Cl. 127-29.000.
Suling, Carlhans: *See*—
Waniczek, Helmut; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Uerdingen, Walter, 4,506,045, Cl. 524-31.000.
Sulku, Jukka: *See*—
Seppanen, Olli; Punttila, Antero; and Sulku, Jukka, 4,505,259, Cl. 126-429.000.
Sullivan, Donald F. Printed wiring board. 4,506,004, Cl. 430-312.000.
Sullivan, Leroy J., to Chartered Industries of Singapore Private Ltd. Firearm trigger mechanism. 4,505,182, Cl. 89-132.000.
Sulzer Brothers Limited: *See*—
Lincke, Paul; Kohlhaas, Oswin; and Wahhoud, Adnan, 4,505,306, Cl. 139-435.000.
Meier, Hans; and Staheli, Werner, 4,505,186, Cl. 92-5.00R.
Sumito, Mitsuo: *See*—
Hamada, Takao; Tsuchiya, Nobuo; Ito, Yo; Inatani, Toshihiro; Takada, Yoshiyasu; Sumito, Mitsuo; Koitabashi, Toshimitsu; and Katayama, Hideshi, 4,505,745, Cl. 75-129.000.
Sumitomo Chemical Company, Limited: *See*—
Omura, Takashi; Takahashi, Mikoto; Harada, Naoki; and Takeshita, Akira, 4,505,714, Cl. 8-549.000.
Shimidzu, Yasutaka; Kenmochi, Hirohito; Ueno, Toshihiko; and Tani, Chizuka, 4,505,549, Cl. 350-349.000.
Sumitomo Electric: *See*—
Onishi, Toshitada; Tateishi, Hiroshi; Koyama, Kenichi; Saito, Shigeo; and Nagata, Masayuki, 4,506,109, Cl. 174-128.00S.
Sumitomo Electric Industries, Ltd.: *See*—
Nakai, Tetsuo; and Yazu, Shuji, 4,505,746, Cl. 75-243.000.
Ueba, Yoshinobu; and Miyake, Shinichi, 4,505,543, Cl. 350-96.340.
Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See*—
Kondo, Katsuya; and Tajima, Shigeru, 4,506,197, Cl. 318-34.000.
Sumner, William C., Jr.; Hoyer, Gale G.; and Kozak, William G., to Dow Chemical Company, The. Method of removing water from alkali metal hydroxide solutions. 4,505,885, Cl. 423-592.000.
Sun Chemical Corporation: *See*—
Floyd, William C.; and North, Bernard F., 4,505,712, Cl. 8-186.000.
Sunamura, Kazuhiro: *See*—
Yuzawa, Haruo; and Sunamura, Kazuhiro, 4,505,248, Cl. 123-519.000.
Sundberg, Erik, to Waller Innovation AB of Falufagen 22. Arrangement in log-feeding apparatus. 4,505,377, Cl. 198-624.000.
Sundstrand Data Control, Inc.: *See*—
Bateman, Charles D., 4,506,328, Cl. 364-463.000.
Sung, Rodney L., to Texaco Inc. Corrosion inhibited motor fuel. 4,505,717, Cl. 44-53.000.
Sung, Rodney L.; Zoleski, Benjamin H.; Herbstman, Sheldon; and Dorn, Peter, to Texaco Inc. Lubricant oil composition containing a friction modifier. 4,505,835, Cl. 252-51.50A.
Sunnen Products Company: *See*—
Sunnen, Robert M., 4,505,076, Cl. 51-206.500.
Sunnen, Robert M., to Sunnen Products Company. Means for drivingly attaching a replaceable stone assembly to a master stone holder. 4,505,076, Cl. 51-206.500.
Super Fuel Systems Incorporated: *See*—
Fuller, Tom E.; and Finell, Lewis R., 4,505,787, Cl. 204-67.000.
Surauer, Michael: *See*—
Gottzein, Eveline; Keeve, Rolf; and Surauer, Michael, 4,505,206, Cl. 104-284 000.
Surisawa, Yooji: *See*—
Nameda, Naoyoshi; Surisawa, Yooji; Nakamoto, Yasunobu; and Sekiya, Hideshi, 4,505,263, Cl. 126-438.000.
Sutoh, Satoshi: *See*—
Honaga, Susumu; and Sutoh, Satoshi, 4,505,655, Cl. 418-133.000.
Suwabe, Hirohisa: *See*—
Furuichi, Shinji; Morita, Shigetoshi; Taka, Shunichi; and Suwabe, Hirohisa, 4,506,308, Cl. 360-121.000.
Suyehiro, Hito: *See*—
Yoshii, Osamu, 4,505,673, Cl. 433-6.000.
Suzuki, Arata; and Allardice, William D., Jr., to Capintec, Inc. Method and apparatus usable with a calibration device for measuring the radioactivity of a sample. 4,506,155, Cl. 250-252.100.
Suzuki, Keiichiro: *See*—
Ashida, Hisashi; and Suzuki, Keiichiro, 4,505,572, Cl. 355-3.00R.
Suzuki, Michihiko; Kawaguchi, Katsukiyo; and Kojima, Yoshihiko, to Aichi Steel Works, Limited. Method for coating metal with a dissimilar metal. 4,505,946, Cl. 427-29.000.
Suzuki, Shigemasa; and Takai, Toshiyuki, to Chu. Kagaku Co., Ltd. Production of resin foam by aqueous medium. 4,506,037, Cl. 521-82.000.
Suzuki, Shigeto; Kurkov, Victor P.; Schroeder, Albert H.; and Denisevich, Peter, Jr., to Chevron Research Company. Heterodiazole electroactive polymers. 4,505,843, Cl. 252-500.000.

Suzuki, Shigeto, to Chevron Research Company. Process for the preparation of 2,6-dialkylaniline from 1-nitroalkene. 4,506,098, Cl. 564-305.000.
Suzuki, Shigeto: *See*—
Kurkov, Victor P.; Schroeder, Albert H.; Denisevich, Peter, Jr.; and Suzuki, Shigeto, 4,505,842, Cl. 252-500.000.
Suzuki, Takashi; Yamagata, Syuzi; and Osako, Jyunji, to Nissan Motor Company, Limited. Front brake tube retaining structure for automotive vehicle. 4,505,354, Cl. 180-297.000.
Suzuki, Takashi; Kimura, Tetsuo; and Tanaka, Seiichi, to Nittan Company, Ltd. Temperature sensor. 4,505,600, Cl. 374-170.000.
Swanson, Barry J.: *See*—
Koch, Tad H.; and Swanson, Barry J., 4,505,792, Cl. 204-159.110.
Swedo, Raymond J.: *See*—
House, David W.; and Swedo, Raymond J., 4,505,846, Cl. 252-500.000.
Sweet, Ian J. H.: *See*—
Rigden, Sydney A. R.; and Sweet, Ian J. H., 4,506,194, Cl. 315-200.00R.
Swenck, George F., to Reynolds Metals Company. Method for recycling cans. 4,505,370, Cl. 194-4.00C.
Sydansk, Robert D., to Marathon Oil Company. Process for utilizing a silicate/silica cement in oil field applications. 4,505,751, Cl. 106-84.000.
Syler, Rodney R., to Apcom, Inc. Water heater construction with sediment removal means. 4,505,231, Cl. 122-159.000.
Sym-Tek Systems, Inc.: *See*—
O'Connor, Bruce, 4,506,213, Cl. 324-73.0AT.
Symons, Robert S., to Varian Associates, Inc. Linear beam tube with reflected electron trap. 4,506,190, Cl. 315-5.350.
Syntex (U.S.A.) Inc.: *See*—
Muchowski, Joseph M.; and Greenhouse, Robert, 4,505,927, Cl. 514-413.000.
System Industries, Inc.: *See*—
Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., 4,506,276, Cl. 346-140.00R.
Systems and Methods, Inc.: *See*—
Shonka, Leonard G., 4,505,046, Cl. 33-184.500.
Szekely, Paul: *See*—
Hesford, Frank W.; Lampe, Jerome L.; and Szekely, Paul, 4,506,144, Cl. 219-497.000.
Szoke, Abraham: *See*—
Prosnitz, Donald; and Szoke, Abraham, 4,506,229, Cl. 330-4.300.
Sztuka, Stanley. Height measurement gage for multifocal lenses. 4,505,043, Cl. 33-174.00A.
Szu, Harold H.: *See*—
Blodgett, Jerry A.; Szu, Harold H.; Giles, C. Lee; and Athale, Ravindra, 4,505,544, Cl. 350-162.130.
Szweda, Andrew: *See*—
Butler, Edwin G.; and Szweda, Andrew, 4,506,020, Cl. 501-97.000.
Tabata, Kengo: *See*—
Kojima, Takemasa; Tabata, Kengo; Yanaki, Toshio; and Mitani, Mitsuaki, 4,505,757, Cl. 127-36.000.
Taco Products, Incorporated: *See*—
Finn, Arnold H., 4,505,313, Cl. 145-29.00R.
Taiho Pharmaceutical Company, Limited: *See*—
Ito, Toshio, 4,505,891, Cl. 424-28.000.
Taito Co., Ltd.: *See*—
Kojima, Takemasa; Tabata, Kengo; Yanaki, Toshio; and Mitani, Mitsuaki, 4,505,757, Cl. 127-36.000.
Taito, Yoshinori: *See*—
Ochiai, Masahiko; and Taito, Yoshinori, 4,505,036, Cl. 30-34.100.
Tajima, Shigeru; Okada, Hiroshi; and Nakano, Kenji, to Sony Corporation. Digital servo circuit. 4,506,202, Cl. 318-603.000.
Tajima, Shigeru: *See*—
Kondo, Katsuya; and Tajima, Shigeru, 4,506,197, Cl. 318-34.000.
Taka, Shunichi: *See*—
Furuichi, Shinji; Morita, Shigetoshi; Taka, Shunichi; and Suwabe, Hirohisa, 4,506,308, Cl. 360-121.000.
Takada, Yoshiyasu: *See*—
Hamada, Takao; Tsuchiya, Nobuo; Ito, Yo; Inatani, Toshihiro; Takada, Yoshiyasu; Sumito, Mitsuo; Koitabashi, Toshimitsu; and Katayama, Hideshi, 4,505,745, Cl. 75-129.000.
Takagi, Hiroshi: *See*—
Sawada, Takeshi; Yoneda, Kou; Shimmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, 4,506,220, Cl. 324-252.000.
Takagi, Yoshiaki: *See*—
Urano, Shigeru; Yamamoto, Kiyoshi; Takagi, Yoshiaki; and Sugawara, Takeshi, 4,505,988, Cl. 428-569.000.
Takahashi, Kenji: *See*—
Umemoto, Chiyuki; and Takahashi, Kenji, 4,505,989, Cl. 428-691.000.
Takahashi, Masaaki: *See*—
Isogai, Sakichi; Mizuhata, Teruo; Takahashi, Masaaki; Imai, Takayoshi; Nakanishi, Kazuyoshi; Ito, Takefumi; and Koshihara, Atsuo, 4,505,397, Cl. 212-232.000.
Takahashi, Mikoto: *See*—
Omura, Takashi; Takahashi, Mikoto; Harada, Naoki; and Takeshita, Akira, 4,505,714, Cl. 8-549.000.
Takai, Toshiyuki: *See*—
Suzuki, Shigemasa; and Takai, Toshiyuki, 4,506,037, Cl. 521-82.000.
Takaki, Hideki; Hayashi, Hiroshi; Ono, Shigetoshi; and Okamura, Hisashi, to Fuji Photo Film Co., Ltd. Diffusion transfer photographic elements with polymer grafted pigment. 4,506,002, Cl. 430-215.000.
Takano, Eiji: *See*—
Hasegawa, Shin-ich; Takano, Eiji; and Sekine, Masao, 4,505,882, Cl. 423-261.000.
Takano, Teruhisa; and Ueda, Shigeki, to Matsushita Electric Industrial Co., Ltd. Voice actuated heating apparatus. 4,506,142, Cl. 219-490.000.
Take, Hiroshi: *See*—
Hamada, Hiroshi; Take, Hiroshi; Yano, Kozo; and Inami, Yasuhiko, 4,505,021, Cl. 29-570.000.
Takeda Chemical Industries, Ltd.: *See*—
Yoshida, Kokichi; Niinobe, Takao; and Baba, Takashi, 4,505,788, Cl. 204-74.000.
Takeda, Hideichiro: *See*—
Kuroda, Koji; and Takeda, Hideichiro, 4,505,983, Cl. 428-423.100.
Takemoto, Hisao: *See*—
Harada, Tsuneo; Takemoto, Hisao; and Igarashi, Tatsuo, 4,506,011, Cl. 435-70.000.
Takemoto, Takeshi, to Ricoh Company, Ltd. Hammer device of printer. 4,505,604, Cl. 400-144.200.
Takemotoyushi Co. Ltd.: *See*—
Yamamoto, Hisao; and Kogiso, Osamu, 4,505,956, Cl. 427-393.100.
Takenaka Komuten Co., Ltd.: *See*—
Isogai, Sakichi; Mizuhata, Teruo; Takahashi, Masaaki; Imai, Takayoshi; Nakanishi, Kazuyoshi; Ito, Takefumi; and Koshihara, Atsuo, 4,505,397, Cl. 212-232.000.
Takenobu, Shinya, to Mitsubishi Denki Kabushiki Kaisha. Light source cathode ray tube. 4,506,191, Cl. 315-14.000.
Takenouchi, Hiroo; Ishida, Hideaki; and Hiyama, Kunio, to Hitachi, Ltd. Text mailing system using a telephone line. 4,506,111, Cl. 179-2.00A.
Takeshita, Akira: *See*—
Omura, Takashi; Takahashi, Mikoto; Harada, Naoki; and Takeshita, Akira, 4,505,714, Cl. 8-549.000.
Takeuchi, Yukihisa; and Tomita, Masahiro, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Exhaust gas cleaning device. 4,505,726, Cl. 55-282.000.
Takezawa, Taihei: *See*—
Togawa, Hideo; Takezawa, Taihei; Watanabe, Masazumi; Hayashi, Kazuya; and Okuhara, Akira, 4,505,938, Cl. 426-46.000.
Takita, Masaaki: *See*—
Kakimoto, Atsushi; Takita, Masaaki; and Watanabe, Shinichi, 4,505,469, Cl. 271-91.000.
Takken, Hendrik J.: *See*—
Kaufhold, Manfred; and Takken, Hendrik J., 4,506,102, Cl. 568-667.000.
Talbot, Marcel G.: *See*—
Plugge, Jerome R., 4,505,490, Cl. 280-63.000.
TAM Ceramics, Inc.: *See*—
Hodgkins, Charles E.; Rose, Daniel C.; and Coller, Dana L., 4,506,026, Cl. 501-135.000.
Tam, Kwok C., to General Electric Company. Limited-angle imaging using multiple energy scanning. 4,506,327, Cl. 364-414.000.
Tamoto, Koji; Umehara, Akira; Nagano, Teruo; Iwasaki, Masayuki; and Aotani, Yoshimasa, to Fuji Photo Film Co., Ltd. Photopolymerizable compositions. 4,505,793, Cl. 204-159.160.
Tanabe, Yoshio, to Alps Electric Co., Ltd. Snap action slide switch with wiping action. 4,506,119, Cl. 200-16.00C.
Tanaka, Akihiko: *See*—
Ohkuma, Takeo; and Tanaka, Akihiko, 4,505,484, Cl. 277-94.000.
Tanaka, Hirokazu: *See*—
Katagi, Takashi; Makino, Shigeru; Tanaka, Hirokazu; and Kobayashi, Yuji, 4,506,270, Cl. 343-914.000.
Tanaka, Hiroshi. Device for detecting aging of developer for automatic film developing apparatus. 4,505,565, Cl. 354-299.000.
Tanaka, Kazuhiko, to Nippon Thomson Co., Ltd. Infinite circuit using rolling bearings for providing rectilinear motion. 4,505,522, Cl. 308-6.00C.
Tanaka, Kunihiko: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, 4,506,076, Cl. 548-119.000.
Tanaka, Kunio: *See*—
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,506,331, Cl. 364-474.000.
Tanaka, Seiichi: *See*—
Suzuki, Takashi; Kimura, Tetsuo; and Tanaka, Seiichi, 4,505,600, Cl. 374-170.000.
Tanaka, Yoko: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Sicinski, Rafal R.; and Tanaka, Yoko, 4,505,906, Cl. 514-167.000.
Tani, Chizuka: *See*—
Shimidzu, Yasutaka; Kenmochi, Hirohito; Ueno, Toshihiko; and Tani, Chizuka, 4,505,549, Cl. 350-349.000.
Tanigawa, Takatoshi; Yaegashi, Sakari; Nakazawa, Tetsuo; Hatazi, Masahiko; and Nango, Tadao, to Hitachi, Ltd.; and Kinsei Kogyo Co., Ltd. Powdered binder for mold-making and a process for preparing a mold by using the same. 4,506,041, Cl. 523-139.000.
Taniguchi, Keishi: *See*—
Sakamoto, Hiroshi; Inaba, Norihiko; and Taniguchi, Keishi, 4,506,278, Cl. 346-216.000.
Tanner, Hans, to George Fischer Ltd. Process and apparatus for packing granular foundry materials. 4,505,316, Cl. 164-37.000.
Tanno, Seikichi: *See*—
Umeda, Takao; Simazaki, Yuzuru; Igawa, Tatsuo; Tanno, Seikichi; Sasaki, Ken; and Miyashita, Takao, 4,505,546, Cl. 350-334.000.

Tanzman, Allan: *See*—
Kryskow, J. Michael, Jr.; and Tanzman, Allan, 4,506,360, Cl. 370-85.000.
Tappe, Horst: *See*—
Buhler, Ulrich; Ribka, Joachim; Tappe, Horst; and Roth, Kurt, 4,505,856, Cl. 534-753.000.
Tarutani, Takashi: *See*—
Ishii, Taiji; and Tarutani, Takashi, 4,505,968, Cl. 428-172.000.
Tashiro, Shuichirow: *See*—
Masuda, Kosaku; and Tashiro, Shuichirow, 4,505,649, Cl. 417-300.000.
Tateishi, Hiroshi: *See*—
Onishi, Toshitada; Tateishi, Hiroshi; Koyama, Kenichi; Saito, Shigeo; and Nagata, Masayuki, 4,506,109, Cl. 174-128.00S.
Tatekura, Koichi: *See*—
Furusawa, Kahei; Nunokawa, Makoto; Ejiri, Yoshihiro; Yamamoto, Hitoshi; Yamazaki, Yoshihiko; and Tatekura, Koichi, 4,505,540, Cl. 350-96.200.
Taubenmann, Peter: *See*—
Ihbe, Jorg; Taubenmann, Peter; Thiele, Heino; and Zettler, Hans-Dieter, 4,505,592, Cl. 366-134.000.
Taylor, Peter; and Levy, Alan A., to Richardson-Vicks Ltd. Pharmaceutical preparation for the topical treatment of acne. 4,505,924, Cl. 514-399.000.
Technicare Corporation: *See*—
Flynn, Michael J., 4,506,374, Cl. 378-2.000.
Tegawa, Masao: *See*—
Ariga, Yoshio; Ishige, Yoshiki; Satoh, Shogi; Tegawa, Masao; Kinugasa, Toshiyuki; and Yamamoto, Toru, 4,505,774, Cl. 156-499.000.
Teijin Limited: *See*—
Adachi, Tomio; Shiozaki, Shigeru; and Tomie, Takashi, 4,505,966, Cl. 428-141.000.
Ogawa, Yoshinari; Sakai, Kouichi; and Akagi, Noriyuki, 4,506,043, Cl. 523-523.000.
Yoshiyuki, Sasaki; and Mitsuo, Matsumoto, 4,505,100, Cl. 57-207.000.
Tektronix, Inc.: *See*—
Shores, David H.; and Whiting, Mark, 4,506,240, Cl. 333-202.000.
Teledyne Industries, Inc.: *See*—
Stevens, Julius J., 4,506,163, Cl. 290-38.00R.
Teletoken Ltd.: *See*—
Weinberger, Zvi, 4,505,498, Cl. 283-91.000.
Telis, Alexandr I.; Epishin, Pavel P.; Korzhov, Viktor I.; Makarov, Gennady A.; Kotlyarenko, Iosif Y.; and Grischenko, Nikolai V., to Ukrainsky Nauchno-Issledovatelsky Institut Stankov I Instrumentov. Automatic temperature control device. 4,506,143, Cl. 219-497.000.
Temme, Helmut, to Gewerkschaft Eisenhutte Westfalia. Scrapers for scraper-chain conveyors. 4,505,379, Cl. 198-731.000.
TenBarge, John S.: *See*—
Lardner, George S.; and TenBarge, John S., 4,505,312, Cl. 141-326.000.
Teng, Lina C.: *See*—
Wright, George J.; and Teng, Lina C., 4,505,907, Cl. 514-210.000.
Terada, Shigeru: *See*—
Okamoto, Masaya; and Terada, Shigeru, 4,505,111, Cl. 60-431.000.
Teraji, Tsutomu: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Nakai, Yoshiharu, 4,506,076, Cl. 548-119.000.
Teramachi, Hiroshi. Linear slide roller bearing unit. 4,505,521, Cl. 308-6.00C.
Terasawa, Koji, to Canon Kabushiki Kaisha. Nozzle-restoring suction device for ink jet printer. 4,506,277, Cl. 346-140.00R.
Terauchi, Kiyoshi; Kawano, Akihiro; and Mabe, Atsushi, to Sanden Corporation. Scroll type compressor with displacement adjusting mechanism. 4,505,651, Cl. 417-440.000.
Terry, Peter L.: *See*—
Dettling, Charles J.; and Terry, Peter L., 4,505,992, Cl. 429-36.000.
Tesar, Delbert, to University of Florida. Control-in-the-small system for precision, under load control of robot manipulator. 4,505,166, Cl. 74-479.000.
Tetrault, Leonard P.: *See*—
Rossi, Vince; Miller, James R.; Tetrault, Leonard P.; and Tripodi, Robert R., 4,505,426, Cl. 236-47.000.
Tetsudo Kizai Kogyo Company Limited: *See*—
Matsuo, Yoshio; and Matsubara, Kentaro, 4,505,428, Cl. 238-349.000.
Texaco Inc.: *See*—
Brennan, Michael E.; and Speranza, George P., 4,506,090, Cl. 560-91.000.
Sung, Rodney L., 4,505,717, Cl. 44-53.000.
Sung, Rodney L.; Zoleski, Benjamin H.; Herbstman, Sheldon; and Dorn, Peter, 4,505,835, Cl. 252-51.50A.
Whiteman, James R.; Edwards, Robert S.; and Perciful, Jerry C., 4,505,832, Cl. 252-42.100.
Texas Instruments Incorporated: *See*—
Jelks, Edward C., 4,505,949, Cl. 427-38.000.
Leigh, Antony W., 4,506,322, Cl. 364-200.000.
Thompson, Barbara J., 4,505,682, Cl. 434-335.000.
Thelen, Wolfgang: *See*—
Rott, Joachim; Thelen, Wolfgang; and Hesselbrock, Bernd, 4,506,353, Cl. 367-91.000.
Thevis, Paul; and Moller, Tilo, to Heckler & Koch GmbH. Fire extinguisher and liquid dispensing apparatus. 4,505,336, Cl. 169-85.000.
Thiele, Gerald H.; and Stamp, David L., to Stauffer Chemical Company. Synergistic herbicidal compositions. 4,505,737, Cl. 71-86.000.
Thiele, Heino: *See*—
Ihbe, Jorg; Taubenmann, Peter; Thiele, Heino; and Zettler, Hans-Dieter, 4,505,592, Cl. 366-134.000.
Thiokol Corporation: *See*—
Barnes, Michael W.; Kristofferson, Clifford E.; and Manzara, Anthony P., 4,506,069, Cl. 528-232.000.
Thiry, William; Westlund, Arnold E., Jr.; and Puckett, Clarence D., to GTE Products Corporation. Par spot lamp. 4,506,316, Cl. 362-309.000.
Thomas, Earl M. Anti-chatter assembly. 4,505,361, Cl. 188-26.000.
Thomas, John E.; Gretz, Ronald D.; and Tippins, George W., to Tippins Machinery Company, Inc. Apparatus for thermomechanically rolling hot strip product to a controlled microstructure. 4,505,141, Cl. 72-38.000.
Thomas, Leslie P., to Diamond Automations, Inc. Egg transfer system. 4,505,373, Cl. 198-432.000.
Thommen, Werner F., to U.S. Philips Corporation. Method of and circuit arrangement for controlling the torque of a stepping motor. 4,506,206, Cl. 318-696.000.
Thompson, Barbara J., to Texas Instruments Incorporated. Speaking learning aid with match and compare mode of operation. 4,505,682, Cl. 434-335.000.
Thompson, Hubert R.: *See*—
Jones, Robert; and Thompson, Hubert R., 4,505,126, Cl. 62-239.000.
Thompson, William J., to Rockwell International Corporation. Third order PLL with increased high frequency gain. 4,506,232, Cl. 331-16.000.
Thomsen, Svend E.; and Kyster, Erik, to Danfoss A/S. Hydraulic control apparatus particularly steering apparatus. 4,505,109, Cl. 60-386.000.
Thomson-CSF: *See*—
Berger, Jean-Luc; and Descure, Patrick, 4,506,299, Cl. 358-213.000.
Briere, Pierre, 4,505,022, Cl. 29-571.000.
Huignard, Jean-Pierre; and Marrakchi El Fellah, Abdellatif, 4,505,536, Cl. 350-3.640.
Porrot, Pascal; and Rougeolle, Daniel, 4,506,333, Cl. 364-487.000.
Thone, Heinrich: *See*—
Schubert, Hermann; and Thone, Heinrich, 4,505,320, Cl. 164-440.000.
Tieleman, Edward J. Stretching mechanism of a device for cutting slaughtered poultry. 4,505,002, Cl. 17-11.000.
Timkin, Alexei F.: *See*—
Yantsen, Ivan A.; Bekishev, Kenes K.; Savchak, Orest G.; Klok, Alexandr B.; Zhanabaev, Tolgat M.; Pakshtas, Mechislav-Valentinas K.; Glotov, Boris N.; Fink, Garold K.; Timkin, Alexei F.; Zorin, Nikolai I.; and Bobylev, Leonid M., 4,505,340, Cl. 173-134.000.
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Thomas, John E.; Gretz, Ronald D.; and Tippins, George W., 4,505,141, Cl. 72-38.000.
Tippins Machinery Company, Inc.: *See*—
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Tischer, Kurt M.; Voigt, Klaus-Peter; and Zondler, Rolf, to International Standard Electric Corporation. Method of manufacturing display structures. 4,505,685, Cl. 445-24.000.
Tjebbes, Johannes C.; and Wolters, Tjako A., to Ballast-Nedam Groep N.V. Dredged soil conveying vessel. 4,505,214, Cl. 114-29.000.
TMC Corporation: *See*—
Gertsch, Ulrich, 4,505,494, Cl. 280-618.000.
Tobioka, Takashi: *See*—
Hara, Hiroshi; Tobioka, Takashi; Nishizawa, Tetuo; and Yoshino, Takeshi, 4,505,562, Cl. 354-203.000.
Tochigi, Kenji; Hanyu, Yoshiaki; and Hiratsuka, Yutaka, to Hitachi, Ltd. Laser Raman spectrophotometry system and adjustment thereof. 4,505,586, Cl. 356-301.000.
Todorova, Yasmina S.: *See*—
Koev, Koycho G.; Nedelcheva, Aneliya A.; Todorova, Yasmina S.; and Uzunova, Iglika T., 4,505,432, Cl. 241-29.000.
Togawa, Hideo; Takezawa, Taihei; Watanabe, Masazumi; Hayashi, Kazuya; and Okuhara, Akira, to Kikkoman Corporation; and Mann's Wine Co., Ltd. Process for producing a seasoning. 4,505,938, Cl. 426-46.000.
Toko, Inc.: *See*—
Endoh, Kunihisa; and Hayakawa, Yasumitsu, 4,506,238, Cl. 333-138.000.
Tokui, Masaaki; Masaoka, Toshika; and Ota, Atsushi, to Toyoto Jidosha Kogyo Kabushiki Kaisha. Vertical type pressure casting method. 4,505,318, Cl. 164-113.000.
Tokyo Sanyo Electric Co., Ltd.: *See*—
Kusakabe, Hiroyoshi; Ishiko, Hideo; Okumura, Takeshi; Izumi, Masashi; and Furukawa, Masahiro, 4,505,123, Cl. 62-148.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Asano, Masamichi; and Iwahashi, Hiroshi, 4,506,350, Cl. 365-191.000.
Kawate, Keiichi; and Sekiya, Hiroshi, 4,505,024, Cl. 29-571.000.
Kurosawa, Kei; and Horiguchi, Fumio, 4,505,025, Cl. 29-576.00W.
Mizuide, Yasuo, 4,506,170, Cl. 307-355.000.
Mizutani, Yoshihisa, 4,506,279, Cl. 357-23.110.
Nagano, Katsumi, 4,506,208, Cl. 323-314.000.
Nameda, Naoyoshi; Surisawa, Yooji; Nakamoto, Yasunobu; and Sekiya, Hideshi, 4,505,263, Cl. 126-438.000.
Sugawara, Toru; and Ito, Yasuyuki, 4,506,160, Cl. 250-427.000.
Sujaku, Takamichi; Aoyama, Shuki; and Fukasawa, Takaaki, 4,506,128, Cl. 219-10.55F.
Tsuneki, Yukio, 4,506,201, Cl. 318-603.000.

Yamamoto, Kazuhiko, 4,506,342, Cl. 364-900.000.
Yamanaka, Junichi; and Nishino, Taizou, 4,506,287, Cl. 358-21.00R.
Yana, Masasumi, 4,505,603, Cl. 400-120.000.
Tomie, Takashi: *See*—
Adachi, Tomio; Shiozaki, Shigeru; and Tomie, Takashi, 4,505,966, Cl. 428-141.000.
Tomita, Masahiro: *See*—
Takeuchi, Yukihisa; and Tomita, Masahiro, 4,505,726, Cl. 55-282.000.
Tomita, Rioe. Magnetic door catch. 4,505,502, Cl. 292-251.500.
Tomiyori, Takashi; Fukuda, Misao; Yamashita, Iwao; Simizu, Nobuo; and Kumano, Takeshi, to Mitsuboshi Belting Ltd. Apparatus for sorting power transmission belts. 4,505,073, Cl. 51-165.00R.
Tomosy, Geza: *See*—
Dee, Richard D.; DiGiacomo, Louis A.; and Tomosy, Geza, 4,505,198, Cl. 101-40.000.
Toner, John L.; and Daniel, Daniel S., to Eastman Kodak Company. Sodium-selective compositions and electrodes containing same. 4,505,800, Cl. 204-418.000.
Tong, Yulan C.. *See*—
Markley, Lowell D.; Tong, Yulan C.; and Wood, Steven G., 4,505,929, Cl. 514-520.000.
Tonouchi, Akira: *See*—
Miwa, Hiroshi; Kaneko, Toshio; Tonouchi, Akira; and Anan, Tatsuro, 4,505,785, Cl. 204-28.000.
Toray Silicone Company, Ltd.: *See*—
Kobayashi, Hideki, 4,505,848, Cl. 252-511.000.
Toriumi, Akihiko: *See*—
Seto, Susumu; and Toriumi, Akihiko, 4,505,569, Cl. 355-3.00R.
Totani Giken Kogyo Kabushiki Kaisha: *See*—
Totani, Mikio, 4,505,699, Cl. 493-196.000.
Totani, Mikio, to Totani Giken Kogyo Kabushiki Kaisha. Apparatus for making envelopes from a continuous film sheet. 4,505,699, Cl. 493-196.000.
Toussaint, Francois; and Hoyois, Jean-Claude, to Glaverbel. Electrochromic display devices. 4,505,538, Cl. 350-357.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Shimada, Masayoshi; Komagata, Hideki; and Iizuka, Yasuhiro, 4,505,994, Cl. 429-101.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Harada, Tsuneo; Takemoto, Hisao; and Igarashi, Tatsuo, 4,506,011, Cl. 435-70.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Honaga, Susumu; and Sutoh, Satoshi, 4,505,655, Cl. 418-133.000.
Toyoda, Toshiyuki: *See*—
Makino, Kenya; Sakurai, Hideo; Toyoda, Toshiyuki; and Matsuo, Yoshitaka, 4,506,061, Cl. 526-142.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kanda, Mutsumi; Matsushita, Souichi; Nakanishi, Kiyoshi; and Inoue, Tokuta, 4,505,233, Cl. 123-41.350.
Shinoda, Kazuo; Miyaki, Masahiko; Masuda, Akira; and Koide, Hiroshi, 4,505,240, Cl. 123-357.000.
Toyoto Jidosha Kogyo Kabushiki Kaisha: *See*—
Tokui, Masaaki; Masaoka, Toshika; and Ota, Atsushi, 4,505,318, Cl. 164-113.000.
TP Industrial, Inc.: *See*—
Fairchild, Meredith H., 4,505,836, Cl. 252-174.140.
Traiger, Irving L.: *See*—
Shaw, Philip S.; Sordi, Joseph J.; and Traiger, Irving L., 4,506,326, Cl. 364-300.000.
Transamerica DeLaval Inc.: *See*—
Hong Le, Da, 4,505,157, Cl. 73-756.000.
Jacobs, John H., 4,505,551, Cl. 350-384.000.
Zajac, Chester J., 4,505,148, Cl. 73-49.200.
Tremblay, Real, to Universite Laval. Electromagnetic wave concentrator. 4,505,264, Cl. 126-439.000.
Trenkle, Robert W.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,506,104, Cl. 568-820.000.
Trieber, Fritz F.: *See*—
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Trigg, Mark B.: *See*—
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Tripodi, Robert R.: *See*—
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Trivedi, Ramesh C.: *See*—
Nix, Paul T.; Goldfarb, Rebecca D.; Stong, Linda J.; Sulick, Lorraine E.; Trivedi, Ramesh C.; and Morgenstern, Stanley W., 4,505,756, Cl. 127-29.000.
Trommer, Reiner, to Siemens Aktiengesellschaft. Manufacturing method for a planar photodiode with hetero-structure. 4,505,765, Cl. 148-171.000.
Trost, David; and Galburt, Daniel, to Perkin-Elmer Corporation, The. Electro-magnetic alignment apparatus. 4,506,205, Cl. 318-653.000.
Trumbore, Conrad N., to University of Delaware. Method and apparatus for determining molecular weight. 4,505,149, Cl. 73-53.000.
Truth Incorporated: *See*—
Sandberg, Christopher T.; and Mosher, Eugene L., 4,505,601, Cl. 384-428.000.
Tsang, Floris Y.: *See*—
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Tsay, Jiann T. Dust blower for circular knitting machines. 4,505,136, Cl. 66-168.000.
Tschanz, Charles M.: *See*—
Kramer, Lee F.; Schantz, Ronald K.; Kirkham, Steven C.; and Tschanz, Charles M., 4,505,339, Cl. 172-812.000.
Tseng, Wen F.; and Bark, Marvin L., to United States of America, Navy. Method of making a planar INP insulated gate field transistor by a virtual self-aligned process. 4,505,023, Cl. 29-571.000.
Tsuboi, Hikotada; Kawamata, Motoo; Oba, Masayuki; and Koga, Nobuhito, to Mitsui Toatsu Chemicals, Inc. Curable resin composition comprising N-(alkenylphenyl)maleimide, epoxy composition and polyamine. 4,506,042, Cl. 523-454.000.
Tsuchikawa, Shunzo; Hayashi, Masaharu; and Hori, Takanobu, to Aisin Seiki Kabushiki Kaisha. Cooling fan for internal combustion engine. 4,505,641, Cl. 416-189.000.
Tsuchiya, Nobuo: *See*—
Hamada, Takao; Tsuchiya, Nobuo; Ito, Yo; Inatani, Toshihiro; Takada, Yoshiyasu; Sumito, Mitsuo; Koitabashi, Toshimitsu; and Katayama, Hideshi, 4,505,745, Cl. 75-129.000.
Tsuji, Shintaro, to Mitsubishi Denki Kabushiki Kaisha. Elevator operating system. 4,505,360, Cl. 187-29.00R.
Tsumura, Takashi: *See*—
Sugino, Yoshihide; Tsumura, Takashi; Nakamura, Junnosuke; and Yamaki, Kazuyoshi, 4,505,636, Cl. 414-736.000.
Tsuneki, Yukio, to Tokyo Shibaura Denki Kabushiki Kaisha. Microprocessor controlled pulse motor. 4,506,201, Cl. 318-603.000.
Tsunoda, Kazuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Rear suspension system for motorcycles. 4,505,492, Cl. 280-284.000.
Tsuruoka, Kazuhiro: *See*—
Shizuka, Masayuki; Ogasawara, Nobuhiko; Kanamaru, Hisanobu; and Tsuruoka, Kazuhiro, 4,506,180, Cl. 310-91.000.
Tsuruya, Tetsuo: *See*—
Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,505,739, Cl. 71-92.000.
Turk, Herbert: *See*—
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Schippers, Heinz; Lenk, Erich; Turk, Herbert; and Schiminski, Herbert, 4,505,437, Cl. 242-43.00A.
Turner, George S.; and Mitchell, Donald B., to Diversitech Corporation. Lightweight concrete cladded heavy equipment base. 4,505,449, Cl. 248-669.000.
Turner, John D., to Cotton Incorporated. Fugitive ink composition. 4,505,944, Cl. 427-8.000.
Turner, Robert C.: *See*—
Boehm, Paul C.; Mortimer, John H.; Rowan, Henry M.; and Turner, Robert C., 4,506,131, Cl. 219-10.770.
Tyler Pipe: *See*—
Marshall, Marshall W., 4,505,814, Cl. 210-166.000.
Ube Industries, Ltd.: *See*—
Uchida, Masashi, 4,505,307, Cl. 141-1.000.
Uchida, Masashi, to Ube Industries, Ltd. Method of pouring molten metal into injection sleeves of die cast machines. 4,505,307, Cl. 141-1.000.
Ueba, Yoshinobu; and Miyake, Shinichi, to Sumitomo Electric Industries, Ltd. Plastic optical fibers. 4,505,543, Cl. 350-96.340.
Ueda, Shigeki: *See*—
Takano, Teruhisa; and Ueda, Shigeki, 4,506,142, Cl. 219-490.000.
Ueno, Toshihiko: *See*—
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Uerdingen, Walter: *See*—
Waniczek, Helmut; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Uerdingen, Walter, 4,506,045, Cl. 524-31.000.
Uglow, Malcolm S.; and Uglow, Phillip J. Roof drain insert coupling. 4,505,499, Cl. 285-42.000.
Uglow, Phillip J.: *See*—
Uglow, Malcolm S.; and Uglow, Phillip J., 4,505,499, Cl. 285-42.000.
Uhlemann, Hans: *See*—
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Uhlemann, Hans, 4,505,870, Cl. 264-206.000.
Ukrainsky Nauchno-Issledovatelsky Institut Stankov I Instrumentov: *See*—
Telis, Alexandr I.; Epishin, Pavel P.; Korzhov, Viktor I.; Makarov, Gennady A.; Kotlyarenko, Iosif Y.; and Grischenko, Nikolai V., 4,506,143, Cl. 219-497.000.
Umeda, Takao; Simazaki, Yuzuru; Igawa, Tatsuo; Tanno, Seikichi; Sasaki, Ken; and Miyashita, Takao, to Hitachi, Ltd. Liquid crystal display device. 4,505,546, Cl. 350-334.000.
Umehara, Akira: *See*—
Tamoto, Koji; Umehara, Akira; Nagano, Teruo; Iwasaki, Masayuki; and Aotani, Yoshimasa, 4,505,793, Cl. 204-159.160.
Umemoto, Chiyuki; and Takahashi, Kenji, to Fuji Photo Film Co., Ltd. Phosphor and radiation image storage panel employing the same. 4,505,989, Cl. 428-691.000.
Umemura, Toshikazu: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikazu; Kawata, Toshikatsu; Kiboshi, Shinzi; and Shibata, Akiyoshi, 4,506,053, Cl. 524-405.000.
Union Carbide Corporation: *See*—
Chiu, Herman S., 4,505,939, Cl. 426-135.000.
Craver, Joseph N., 4,505,970, Cl. 428-213.000.
Unisearch Limited: *See*—
Barnes, David; and Bliss, Peter J., 4,505,819, Cl. 210-603.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Fidler, John; and Green, John M., 4,505,202, Cl. 102-357.000.
U.S. Filigree Wideslab, Inc.: *See*—
Sarda, Nandy M., 4,505,087, Cl. 52-741.000.
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Agriculture: *See*—
Klesius, Phillip H.; and Brown, Bobby G., 4,505,277, Cl. 128-769.000.
Air Force: *See*—
Greene, Edward E., 4,506,269, Cl. 343-872.000.
Mayer, Arnold H., 4,505,124, Cl. 62-180.000.
Zuleeg, Rainer; and Notthoff, Johannes K., 4,505,582, Cl. 356-5.000.
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Bush, Clarence C., deceased, 4,505,200, Cl. 102-293.000.
Chase, Roger P., 4,506,210, Cl. 324-66.000.
Lilley, Jay S.; and Arszman, Jerrold H., 4,505,153, Cl. 73-117.400.
Womack, Dennis R., 4,505,876, Cl. 376-326.000.
Energy: *See*—
Blaedel, Kenneth L., 4,505,287, Cl. 137-12.000.
Fiarman, Sidney; Degen, Michael F.; and Peters, Henry F., 4,505,218, Cl. 116-200.000.
Meisner, John W.; Moore, Robert M.; and Bienvenue, Louis L., 4,505,644, Cl. 417-50.000.
Neet, Thomas E.; and Spieker, David A., 4,505,973, Cl. 428-317.900
Prosnitz, Donald; and Szoke, Abraham, 4,506,229, Cl. 330-4.300.
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Hsu, Li-Chen; Philipp, Warren H.; Sheibley, Dean W.; and Gonzalez-Sanabria, Olga D., 4,505,998, Cl. 429-206.000.
Morris, James F., 4,506,183, Cl. 310-306.000.
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Healy, Leonard D., 4,506,324, Cl. 364-200.000.
Lee, Lester A., 4,506,368, Cl. 372-53.000.
Tseng, Wen F.; and Bark, Marvin L., 4,505,023, Cl. 29-571.000.
Vittoria, Carmine, 4,506,234, Cl. 332-16.00R.
U.S. Philips Corporation: *See*—
Bukoschek, Romuald L.; and Steiner, Peter, 4,506,178, Cl. 310-41.000.
Burgin, Kenneth N., 4,506,114, Cl. 179-81.00A.
Giller, Henricus F. J. I.; van Hees, Antonius J. M.; and Roelevink, Bauke J., 4,506,185, Cl. 313-113.000.
Shannon, John M., 4,506,284, Cl. 357-52.000.
Thommen, Werner F., 4,506,206, Cl. 318-696.000.
United Technologies Corporation: *See*—
Hill, Edward C., 4,505,642, Cl. 416-193.00A.
Hsing, Frederick F.; and Leogrande, John A., 4,505,640, Cl. 416-97.00R.
Universal Electric Company: *See*—
Colwell, Robert; and Bartell, Robert J., 4,505,031, Cl. 29-596.000.
Universite Laval: *See*—
Tremblay, Real, 4,505,264, Cl. 126-439.000.
University of California: *See*—
Lenhoff, Howard M.; and Ngo, That T., 4,506,009, Cl. 435-7.000.
University of Delaware: *See*—
Trumbore, Conrad N., 4,505,149, Cl. 73-53.000.
University of Florida: *See*—
Bergeron, Raymond J., Jr., 4,505,861, Cl. 260-465.00E.
Tesar, Delbert, 4,505,166, Cl. 74-479.000.
University of Strathclyde: *See*—
Jackson, John, 4,505,847, Cl. 252-511.000.
University Patents, Inc.: *See*—
Koch, Tad H.; and Swanson, Barry J., 4,505,792, Cl. 204-159.110.
UOP Inc.: *See*—
Barley, Geoffrey W., 4,505,513, Cl. 297-307.000.
Carson, Don B., 4,505,758, Cl. 134-1.000.
House, David W., 4,505,845, Cl. 252-500.000.
House, David W.; and Swedo, Raymond J., 4,505,846, Cl. 252-500.000.
Imai, Tamotsu; and Hung, Chi-Wen, 4,506,032, Cl. 502-223.000.
Kuchar, Paul J.; Sampson, Robert W.; and Pacanowski, Ronald F., 4,505,147, Cl. 73-29.000.
Upjohn Company, The: *See*—
Argoudelis, Alexander D.; Marshall, Vincent P.; and Wiley, Paul F., 4,505,895, Cl. 424-117.000.
Urano, Shigeru; Yamamoto, Kiyoshi; Takagi, Yoshiaki; and Sugawara, Takeshi, to Honda Piston Ring Co., Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Sintered alloy for valve seat. 4,505,988, Cl. 428-569.000.
Urquhart, John: *See*—
Gale, Robert M.; and Urquhart, John, 4,505,703, Cl. 604-317.000.
Usami, Kenichi; Kirihara, Seishin; Doi, Hiroyuki; Asano, Choichi; Sukekawa, Masayuki; and Sakaguchi, Yasuhide, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Boiler tube. 4,505,232, Cl. 122-511.000.
Usenko, Viktor G.: *See*—
Makarov, Viktor M.; Paton, Boris E.; Globin, Nikolai K.; Usenko, Viktor G.; Khismatulin, Enver R.; Ziselman, Boris G.; Serov, Petr G.; Shel, Marat M.; and Rozenberg, Ovshiya O., 4,505,417, Cl. 228-17.700.
USV Pharmaceutical Corporation: *See*—
Loev, Bernard; Jones, Howard; and Suh, John T., 4,505,920, Cl. 514-341.000.
Loev, Bernard; Chan, Wan-Kit; and Jones, Howard, 4,505,930, Cl. 514-529.000.
Utaka, Katsuyuki: *See*—
Akiba, Shigeyuki; Sakai, Kazuo; Utaka, Katsuyuki; and Matsushima, Yuichi, 4,506,367, Cl. 372-45.000.
Utsumi, Shunji; and Chikaraishi, Takayo, to Nissan Motor Company, Limited; and Ohi Seisakusho Co., Ltd. Door lock arrangement for automotive vehicle. 4,505,500, Cl. 292-48.000.
Utsumi, Yoshihiro, to Pioneer Electronic Corporation. Tracking servo signal generating device in an apparatus for reading recorded information. 4,506,149, Cl. 250-202.000.
Utyamyshev, Rustam I.; Smirnov, Boris A.; Kanshin, Nikolai N.; Korolkov, Ivan A.; and Ivanova, Tatyana L. Surgical suturing instrument for performing anastomoses between structures of the digestive tract. 4,505,272, Cl. 128-305.000.
Uya, Masaru, to Matsushita Electric Industrial Co., Ltd. Schmitt trigger circuit. 4,506,168, Cl. 307-290.000.
Uzunova, Iglika T.: *See*—
Koev, Koycho G.; Nedelcheva, Aneliya A.; Todorova, Yasmina S.; and Uzunova, Iglika T., 4,505,432, Cl. 241-29.000.
Vahlensieck, Hans-Joachim: *See*—
Fischer, Peter; Groh, Reiner; and Vahlensieck, Hans-Joachim, 4,506,087, Cl. 556-471.000.
VALEO: *See*—
Herbulot, Jean; and Jumel, Bernard, 4,505,363, Cl. 188-72.500.
Vamatex S.p.A.: *See*—
Pezzoli, Nello, 4,505,305, Cl. 139-448.000.
Van Express, Inc.: *See*—
Simeri, Albert R.; and Simeri, Paul S., 4,505,509, Cl. 296-63.000.
VanBreemen, Bertram: *See*—
Young, James R.; and VanBreemen, Bertram, 4,506,295, Cl. 358-60.000.
Vance, Ian A. W.; Jeffrey, Colin; Bidwell, Brian A.; Leevers, David F. A.; and Woodley, Michael J. A., to International Standard Electric Corporation. Synchronization of digital radio pager. 4,506,262, Cl. 340-825.440.
van der Lely, Cornelis. Articulated tractor with two engines in tandem. 4,505,353, Cl. 180-235.000.
van Hees, Antonius J. M.: *See*—
Giller, Henricus F. J. I.; van Hees, Antonius J. M.; and Roelevink, Bauke J., 4,506,185, Cl. 313-113.000.
Vanhoutte, Jan E., to Fabrique Nationale Herstal. Tennis racket having alveoli filled honeycomb reinforcement. 4,505,480, Cl. 273-73.00C.
Van Laere, Christiaan G. M. Hand-holdable electric power tool apparatus. 4,505,170, Cl. 81-464.000.
van Oosten, Adriaan M.: *See*—
Gut, Jiri; and van Oosten, Adriaan M., 4,505,934, Cl. 514-762.000.
Varian Associates, Inc.: *See*—
Siddall, Graham J., 4,506,184, Cl. 310-328.000.
Symons, Robert S., 4,506,190, Cl. 315-5.350.
Vasta, Joseph A. Coating composition of a solution fluorocarbon polymer, a dispersed fluorocarbon polymer and a polyamine curing agent. 4,506,054, Cl. 524-413.000.
Vatter, Waldemar: *See*—
Reinartz, Hans-Dieter; and Vatter, Waldemar, 4,505,113, Cl. 60-535.000.
VBM Corporation: *See*—
Beatty, Harry F., 4,505,455, Cl. 254-89.00H.
VDO Adolf Schindling AG: *See*—
Pfalzgraf, Manfred; and Graf, Kunibert, 4,505,357, Cl. 180-335.000.
Sauerschell, Wolfgang; Ruschek, Gerhard; and Mann, Arnold, 4,505,151, Cl. 73-116.000.
Wolf, Dieter; and Muller, Joachim, 4,505,598, Cl. 368-309.000.
Veillard, Dominique H., to Eastman Kodak Company. Interleaved redundancy in data recording. 4,506,306, Cl. 360-47.000.
Vella, John C. Shelter frame couplings. 4,505,609, Cl. 403-91.000.
Venture Chemicals, Inc.: *See*—
Cowan, Jack C., 4,505,750, Cl. 106-38.350.
Vermilyea, Mark E., to General Electric Company. Axisymmetric correction coil system for NMR magnets. 4,506,247, Cl. 335-216.000.
Vet, Maarten: *See*—
Dumas, Ted A.; Vet, Maarten; and Buchmeyer, Sam K., 4,506,265, Cl. 343-704.000.
Vickers Australia Limited: *See*—
Griffiths, Anthony J.; and Allen, David W., 4,505,811, Cl. 209-17.000.
Vickers Incorporated: *See*—
Dean, Laurence C., Jr.; and Cardinale, Louis J., 4,505,654, Cl. 418-80.000.
Vigh, James A., to Stanadyne, Inc. Sink mounting. 4,504,986, Cl. 4-633.000.
Vinci, James N., to Lubrizol Corporation, The. Metal working using lubricants containing basic alkali metal salts. 4,505,830, Cl. 252-33.000.
Vish-Mahinnoelektritechnicheski Institute: *See*—
Koev, Koycho G.; Nedelcheva, Aneliya A.; Todorova, Yasmina S.; and Uzunova, Iglika T., 4,505,432, Cl. 241-29.000.
Vite, Lutz; and Mews, Hannelore, to Siemens Aktiengesellschaft. Method for manufacturing boron-free silicon dioxide. 4,505,883, Cl. 423-335.000.
Vittoria, Carmine, to United States of America, Navy. Amplitude and phase modulation in fin-lines by electrical tuning. 4,506,234, Cl. 332-16.00R.

Voest-Alpine Aktiengesellschaft: *See*—
Schubert, Hermann; and Thone, Heinrich, 4,505,320, Cl. 164-440.000.

Vogt, James A.: *See*—
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,505,727, Cl. 55-387.000.

Voigt, Klaus-Peter: *See*—
Tischer, Kurt M.; Voigt, Klaus-Peter; and Zondler, Rolf, 4,505,685, Cl. 445-24.000.

Voirol, Peter: *See*—
Ruegg, Christoph; and Voirol, Peter, 4,505,979, Cl. 428-379.000.

von Huth Smith, Ulf M., to Danfoss A/S. Hydrostatic steering system. 4,505,110, Cl. 60-384.000.

Vossen, Franz, to Meurer Non-Food Product GmbH. Container made of cardboard or the like material and blank for said container. 4,505,422, Cl. 229-37.00R.

Vukanovic, Vladimir; Butler, Susannah M.; Fazekas, George; and Miller, John R., to Standard Oil Company (Ohio), The. Method for the deposition of coatings upon substrates utilizing a high pressure, non-local thermal equilibrium arc plasma. 4,505,947, Cl. 427-34.000.

Vysiotis, Theodoros: *See*—
Adalbert, Gerhard; and Vysiotis, Theodoros, 4,505,656, Cl. 418-270.000.

W. Haking Enterprises Limited: *See*—
Wong, Wan C.; and Oshima, Shigeru, 4,505,563, Cl. 354-234.100.

WABCO Fahrzeugbremsen GmbH: *See*—
Heger, Werner; Kaltenthaler, Wolfgang; and Wilke, Helmut, 4,505,648, Cl. 417-297.000.

Wada, Masaru: *See*—
Wada, Takashi; Wada, Masaru; and Matsu, Toshi, 4,505,252, Cl. 126-246.000.

Wada, Takashi; Wada, Masaru; and Matsu, Toshi, to American Hospital Supply Corporation. Hollow dishes with meltable cores and method of making such dishes. 4,505,252, Cl. 126-246.000.

Wagenknecht, Arthur J.: *See*—
Koenigsberg, William D.; and Wagenknecht, Arthur J., 4,506,192, Cl. 315-71.000.

Wahhoud, Adnan: *See*—
Lincke, Paul; Kohlhaas, Oswin; and Wahhoud, Adnan, 4,505,306, Cl. 139-435.000.

Wahl, Georg: *See*—
Neidig, Arno; Berndt, Dietmar; Wahl, Georg; and Wittmer, Mark, 4,505,418, Cl. 228-122.000.

Waisala, Steven J.: *See*—
Hunt, Patricia K.; and Waisala, Steven J., 4,505,161, Cl. 73-863.000.

Waite, Warren A.: *See*—
Hodgdon, Russell B.; and Waite, Warren A., 4,505,797, Cl. 204-252.000.

Waldmann, Bernd: *See*—
Hildebrand, Reinhard; and Waldmann, Bernd, 4,505,324, Cl. 165-42.000.

Walker, Donald C.; and Ginsburgh, Irwin, to Standard Oil Company (Indiana). Sealing device for liquid dispensing nozzles which recover vapor having conduit internal to fillpipe. 4,505,308, Cl. 141-59.000.

Walker, James D.: *See*—
Shenberger, Paul S.; Walker, James D.; and Campbell, Willis R., 4,505,197, Cl. 100-5.000.

Walker Limited Partnership: *See*—
Nelson, Steve; Reynolds, Frank; Roos, George E.; and Ball, John, 4,505,179, Cl. 89-1.00G.

Waller Innovation AB of Falufagen 22: *See*—
Sundberg, Erik, 4,505,377, Cl. 198-624.000.

Walman, Gerald B. Intraocular lens. 4,504,981, Cl. 3-13.000.

Walter, Howard F. Programming-on-demand cable system and method. 4,506,387, Cl. 455-612.000.

Walter, John F., to Crosby Valve & Gage Company. Slurry valve. 4,505,294, Cl. 137-241.000.

Walter, Lothar: *See*—
Muller, Leo; Koder, Walter; Brandenstein, Manfred; Walter, Lothar; Edelmann, Ludwig; Bonengel, Roland; and Haas, Roland, 4,505,369, Cl. 192-98.000.

Waltman, John H. Rotisserie. 4,505,195, Cl. 99-427.000.

Waniczek, Helmut; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Uerdingen, Walter, to Bayer Aktiengesellschaft. Cellulose ester-aliphatic polycarbonate thermoplastic moulding compositions. 4,506,045, Cl. 524-31.000.

Ward, Bennett C.: *See*—
Choe, Eui W.; Conciatori, Anthony B.; and Ward, Bennett C., 4,506,068, Cl. 528-207.000.

Warner-Ishi: *See*—
Matsuoka, Hideaki, 4,505,117, Cl. 60-609.000.

Warner-Lambert Company: *See*—
Elslager, Edward F.; and Werbel, Leslie M., 4,505,925, Cl. 514-405.000.
Herrmann, Wolfgang; and Gebhardt, Uwe, 4,506,071, Cl. 544-49.000.

Warner, Lee A.; and Fewin, Fred A., Jr., to Cotton Incorporated. Method and apparatus for dumping containers. 4,505,631, Cl. 414-359.000.

Warren, Douglas H.; and Wentzell, Timothy H., to Combustion Engineering Co., Inc. Vessel inspection boom. 4,505,874, Cl. 376-249.000.

Waschulewski, Hans-Georg: *See*—
Baier, Heinrich; Waschulewski, Hans-Georg; and Kurten, Hans-Werner, 4,505,356, Cl. 180-322.000.

Watanabe, Hiroo: *See*—
Nakayama, Shozo; and Watanabe, Hiroo, 4,505,677, Cl. 433-132.000.

Watanabe, Isao: *See*—
Dan, Takuya; Watanabe, Isao; and Kurata, Tomoyuki, 4,505,462, Cl. 267-140.200.

Watanabe, Masazumi: *See*—
Togawa, Hideo; Takezawa, Taihei; Watanabe, Masazumi; Hayashi, Kazuya; and Okuhara, Akira, 4,505,938, Cl. 426-46.000.

Watanabe, Shinichi: *See*—
Kakimoto, Atsushi; Takita, Masaaki; and Watanabe, Shinichi, 4,505,469, Cl. 271-91.000.

Watling, Robert E.: *See*—
Rice, Richard M.; Watling, Robert E.; and Henderson, Drew R., 4,506,146, Cl. 219-499.000.

Watrous, Robert B. Magnetic head slider and actuator assembly. 4,506,307, Cl. 360-106.000.

Watson, Clifford A.: *See*—
Bishop, Charles D.; Powell, Joe R.; Stamps, Kenneth H.; and Watson, Clifford A., 4,505,194, Cl. 99-336.000.

Wayman, William H.: *See*—
Brewington, Grace T.; Bolte, Steven B.; Hays, Dan; and Wayman, William H., 4,505,573, Cl. 355-3.0DD.

Wean United, Inc.: *See*—
George, David W., 4,505,771, Cl. 156-285.000.

Weber, Arthur. Appliance for the relief of arthritic pain. 4,505,271, Cl. 128-157.000.

Weber, Georg: *See*—
Romer, Michael; Krause, Joachim; and Weber, Georg, 4,505,838, Cl. 252-299.630.

Weber, Neill, to Ford Motor Company. Sodium heat engine electrical feedthrough. 4,505,991, Cl. 429-11.000.

Wedtech Corp.: *See*—
Pinkhasov, Eduard, 4,505,948, Cl. 427-37.000.

Wegner, Jurgen: *See*—
Dierichs, Wolfgang; Eberhardt, Werner; and Wegner, Jurgen, 4,505,964, Cl. 428-85.000.

Weiler Brush Company Inc.: *See*—
Weiler, Karl M., 4,504,997, Cl. 15-179.000.

Weiler, Karl M., to Weiler Brush Company Inc. Brushing tool. 4,504,997, Cl. 15-179.000.

Weiler, Rolf; and Bohm, Peter, to ITT Industries, Inc. Dual-circuit brake control arrangement. 4,505,116, Cl. 60-562.000.

Weinberger, Zvi, to Teletoken Ltd. Optically-readable cards. 4,505,498, Cl. 283-91.000.

Weiner, Milton L., to Mobil Oil Corporation. Oriented polypropylene with linear low density poly-ethylene copolymer coating. 4,505,969, Cl. 428-213.000.

Weiner, Robert C. Tamper-indicating device and method. 4,505,399, Cl. 215-230.000.

Weingand, Kaspar: *See*—
Auracher, Franz; Buerk, Hermann; Keil, Rudolf; Stockmann, Michael; Weingand, Kaspar; and Zeitler, Karl-Heinz, 4,505,539, Cl. 350-96.150.

Weinhardt, Erolf: *See*—
Hofmann, Dieter; and Weinhardt, Erolf, 4,506,187, Cl. 313-341.000.

Weir, Donald R.; Masters, Ian M.; and Bolton, Gerald L., to Sherritt Gordon Mines Limited. Recovery of zinc from zinc containing sulphidic material. 4,505,744, Cl. 75-120.000.

Weir, Stanley M.: *See*—
Loos, Evelyn J., 4,504,996, Cl. 15-105.000.

Weitz, Hans-Martin; Fischer, Rolf; and Paust, Joachim, to BASF Aktiengesellschaft. 2-Alkyl-2,4-diacyloxy-but-3-enals. 4,506,096, Cl. 560-262.000.

Welzel, Josef; and Krieger, Karl, to Hermann Hemscheidt Maschinenfabrik GmbH & Co. 3-Port, 2-position directional control valve. 4,505,299, Cl. 137-596.100.

Wentzell, Timothy H.: *See*—
Warren, Douglas H.; and Wentzell, Timothy H., 4,505,874, Cl. 376-249.000.

Werbel, Leslie M.: *See*—
Elslager, Edward F.; and Werbel, Leslie M., 4,505,925, Cl. 514-405.000.

Wescam Services Inc.: *See*—
Murray, Francis E., 4,505,776, Cl. 162-51.000.

West, James D.: *See*—
Lee, Chie-Ying; West, James D.; and Cole, Gerald F., 4,505,697, Cl. 494-35.000.

Westerwalder Eisenwerk Gerhard GmbH: *See*—
Gerhard, Helmut, 4,505,402, Cl. 220-1.500.

Westfalia Separator: *See*—
Broker, Klaus-Dieter, 4,505,698, Cl. 494-40.000.

Westfalia Separator AG: *See*—
Zettier, Karl-Heinz, 4,505,700, Cl. 494-30.000.

Westinghouse Electric Corp.: *See*—
Evans, William P.; McCabe, Robert J.; and Naviasky, Eric H., 4,506,171, Cl. 307-362.000.
Steinbruegge, Kenneth B., 4,505,550, Cl. 350-372.000.

Westlund, Arnold E., Jr.: *See*—
Thiry, William; Westlund, Arnold E., Jr.; and Puckett, Clarence D., 4,506,316, Cl. 362-309.000.

Westvaco Corporation: *See*—
DeLigt, John; and Nikkel, Willem A., 4,505,090, Cl. 53-137.000.
Gowan, John W., Jr., 4,505,754, Cl. 106-238.000.
Klein, Edward P., 4,505,137, Cl. 68-62.000.

Wetter, Klaus: *See*—
Aigner, Heinrich; Merget, Norbert; Norden, Jurgen; Schweppe, Manfred; and Wetter, Klaus, 4,505,732, Cl. 71-11.000.

Weydt, Willy V. D.; Hannen, Ulrich; and Paetzel, Herbert, to McGraw-Edison Company. Pneumatic actuator. 4,505,188, Cl. 92-94.000.

Weyerhaeuser Company: *See*—
Harding, Margot J.; Gaines, Robert C.; and Gess, Jerome M., 4,505,775, Cl. 162-9.000.

Wheeldon, John B.; Jeffery, John; and Myerscough, Paul F., to Scapa-Porritt Limited. Edge guard means for a link belt and a link belt embodying such means. 4,505,383, Cl. 198-853.000.

Wheeler, Edward S., to Interpace Corporation. Methods of making high voltage resistant members. 4,505,033, Cl. 29-631.000.

Wheeler, Harold E., to Wheeler Tool Company, The. Polygon box tool milling cutter applied to automatic screw machines. 4,505,627, Cl. 409-190.000.

Wheeler Tool Company, The: *See*—
Wheeler, Harold E., 4,505,627, Cl. 409-190.000.

White, James T., Sr.; and Kennedy, Dan J., to Reichhold Chemicals Incorporated. Water soluble one-component polymeric resin binder system for fiberglass mats. 4,506,060, Cl. 525-163.000.

White, Roger N.: *See*—
Gregory, Paul E., Jr.; and White, Roger N., 4,504,978, Cl. 2-59.000.
King, Mary K.; White, Roger N.; and Gregory, Paul E., Jr., 4,504,977, Cl. 2-51.000.

Whiteman, James R.; Edwards, Robert S.; and Perciful, Jerry C., to Texaco Inc. Anti-fretting additive for grease comprising the reaction product of an alkenyl succinic anhydride and an alkanolamine. 4,505,832, Cl. 252-42.100.

Whiteside, Michael G. Package assemblies. 4,505,389, Cl. 206-460.000.

Whiting, Mark: *See*—
Shores, David H.; and Whiting, Mark, 4,506,240, Cl. 333-202.000.

Whitlow, H. Donald: *See*—
Koval, Alexander; and Whitlow, H. Donald, 4,505,338, Cl. 172-611.000.

Whittemore, Dwight S.; and Michael, David J., to Dresser Industries, Inc. Slide Gates. 4,506,022, Cl. 501-100.000.

Whittle, Peter J.: *See*—
Cooper, Kevin; Richardson, Kenneth; and Whittle, Peter J., 4,505,919, Cl. 514-340.000.

Wicanders AB: *See*—
Berglund, Jan, 4,505,401, Cl. 215-252.000.

Wico Corporation: *See*—
Wiczer, Max, 4,505,165, Cl. 74-471.0XY.

Wiczer, Max, to Wico Corporation. Trackball device. 4,505,165, Cl. 74-471.0XY.

Wiedman, Francis W.: *See*—
Kalter, Howard L.; and Wiedman, Francis W., 4,506,341, Cl. 364-786.000.

Wienges, Hans: *See*—
Gehrig, Manfred; Barthels, Manfred; and Wienges, Hans, 4,506,072, Cl. 544-274.000.

Wiesner, Reiner, to Forschungsgesellschaft Druckmaschinen e.V. Contactless measuring device for real-time detection of the properties and quantities respectively characteristic of the separation of volumes of liquid and the splitting of layers of liquid in the nips formed by the rollers on printing machines. 4,505,154, Cl. 73-150.00R.

Wiet, Paul A.: *See*—
Quin, Rene A.; Wiet, Paul A.; and Caputi, Jean-Louis M., 4,505,295, Cl. 137-315.000.

Wigdahl, Arthur G. Water heater for divers and for other uses. 4,505,254, Cl. 126-367.000.

Wiggins, Douglas G.: *See*—
Kingsley, William; Stoffel, James C.; Moreland, John F., Jr.; Matteson, Ronald G.; Wiggins, Douglas G.; and Allis, Robert F., 4,506,301, Cl. 358-280.000.

Wikstrom, Arne, to Aktiebolaget Bofors. Drive element for a subcalibre projectile. 4,505,204, Cl. 102-523.000.

Wiley, Paul F.: *See*—
Argoudelis, Alexander D.; Marshall, Vincent P.; and Wiley, Paul F., 4,505,895, Cl. 424-117.000.

Wilke, Helmut: *See*—
Heger, Werner; Kaltenthaler, Wolfgang; and Wilke, Helmut, 4,505,648, Cl. 417-297.000.

Wilking, Hans; Heinrich, Kurt; and Peetz, Walter, to Keiper Automobiltechnik GmbH & Co. KG. Hinge, particularly for seat with adjustable back rest. 4,505,515, Cl. 297-352.000.

Wilkinson, John M. Balancing board. 4,505,477, Cl. 272-146.000.

Williams, Dylan F.: *See*—
Cho, Frederick Y.; and Williams, Dylan F., 4,506,239, Cl. 333-196.000.

Willy Scheuerle Fahrzeugfabrik GmbH & Co.: *See*—
Prechtel, Georg, 4,505,347, Cl. 180-14.200.

Wilson, Bryce H., to Continental Disc Corporation. Rupture disc apparatus. 4,505,289, Cl. 137-68.00R.

Wilson, David: *See*—
Scales, John T.; Poole, Anthony G.; Wilson, David; and Middleton, Anthony J., 4,504,990, Cl. 5-459.000.

Wilson, David S.: *See*—
Hannett, William J.; and Wilson, David S., 4,505,650, Cl. 417-426.000.

Wilson, Francis D.: *See*—
Streatfield, Roy; and Wilson, Francis D., 4,505,302, Cl. 138-97.000.

Wilson Industries, Inc.: *See*—
Sharp, Harper E., 4,505,048, Cl. 33-313.000.

Winkelmann, Johannes: *See*—
Biedermann, Jurgen; Etschenberg, Eugen; Friehe, Hugo; Scheef, Wolfgang; and Winkelmann, Johannes, 4,505,854, Cl. 260-112.50R.

Wisconsin Alumni Research Foundation: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Sicinski, Rafal R.; and Tanaka, Yoko, 4,505,906, Cl. 514-167.000.

Wisotsky, Max J., to Exxon Research & Engineering Co. Lubricating oil composition containing sediment-reducing additive. 4,505,829, Cl. 252-32.70E.

Witman, Mark W.; and Reinert, Gerard E., to Mobay Chemical Corporation. Polycarbonate compositions having improved rigidity. 4,506,047, Cl. 524-89.000.

Wittenbach, Paul G., to Phillips Petroleum Company. Welding spacer. 4,505,420, Cl. 228-212.000.

Wittmer, Mark: *See*—
Neidig, Arno; Berndt, Dietmar; Wahl, Georg; and Wittmer, Mark, 4,505,418, Cl. 228-122.000.

Wolf, Dieter; and Muller, Joachim, to VDO Adolf Schindling AG. Case for a clock. 4,505,598, Cl. 368-309.000.

Wolff, Robin K.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,506,104, Cl. 568-820.000.

Wolo Manufacturing Corporation: *See*—
Solow, Joseph E., 4,505,140, Cl. 70-424.000.

Wolters, Johannes; David, Paul-Johannes; and Heller, Monika, to Kernforschungsanlage Julich GmbH. Coolant standpipe system for protection of a nuclear reactors safety vessel against breakdown from overpressure. 4,505,875, Cl. 376-283.000.

Wolters, Tjako A.: *See*—
Tjebbes, Johannes C.; and Wolters, Tjako A., 4,505,214, Cl. 114-29.000.

Woltersdorf, Otto W., Jr.: *See*—
Hoffman, Jacob M., Jr.; and Woltersdorf, Otto W., Jr., 4,505,923, Cl. 514-229.000.

Wolzenburg, Heinrich, to Hoesch AG. Wire race bearing with rolling contact. 4,505,525, Cl. 384-565.000.

Womack, Dennis R., to United States of America, Army. Nuclear heated and powered metal excimer laser. 4,505,876, Cl. 376-326.000.

Wong, Tak M., to Square D Company. Interlock scheme for high amperage molded case circuit breaker. 4,506,246, Cl. 335-164.000.

Wong, Wan C.; and Oshima, Shigeru, to W. Haking Enterprises Limited. Electronic shutter for still cameras. 4,505,563, Cl. 354-234.100.

Wong, Wyman S. Method for encoding ideographic characters. 4,505,602, Cl. 400-110.000.

Wood, Richard B.: *See*—
Shipp, Kenneth O., Jr.; Wood, Richard B.; and Repass, James T., 4,506,343, Cl. 364-900.000.

Wood, Steven G.: *See*—
Markley, Lowell D.; Tong, Yulan C.; and Wood, Steven G., 4,505,929, Cl. 514-520.000.

Woodley, Michael J. A.: *See*—
Vance, Ian A. W.; Jeffrey, Colin; Bidwell, Brian A.; Leevers, David F. A.; and Woodley, Michael J. A., 4,506,262, Cl. 340-825.440.

Woodruff, Frank; Ferguson, John H., Jr.; and Hoffman, John R., to Bendix Corporation, The. Integrated hydraulic control circuit for jet engine thrust reverser and variable exhaust nozzle. 4,505,108, Cl. 60-327.000.

Woodruff, Frederick W.; Hughey, Daniel C.; and Smart, William L., to Ransburg Corporation. Ground assurance circuit. 4,506,260, Cl. 340-649.000.

Wozniak, Leonard J.; and Brasie, William C., to Dow Chemical Company, The. Filter support assembly. 4,505,816, Cl. 210-439.000.

Wright, Anthony P.: *See*—
Hinchcliffe, Dennis; and Wright, Anthony P., 4,505,091, Cl. 53-444.000.

Wright, Bernard S.: *See*—
Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., 4,506,106, Cl. 585-312.000.

Wright, George J.; and Teng, Lina C., to A. H. Robins Company, Inc. N-Formyl and N-hydroxymethyl-3-phenoxy-1-azetidinecarboxamides. 4,505,907, Cl. 514-210.000.

Wright, William H.; and Kruse, John M., to C.W. Zumbiel Co., The. Method of erecting a compliance carrier. 4,505,696, Cl. 493-130.000.

Wuerzer, Bruno: *See*—
Plath, Peter; Rohr, Wolfgang; and Wuerzer, Bruno, 4,505,741, Cl. 71-92.000.

Wuethrich, Ernest E.: *See*—
Chan, Fred N.; and Wuethrich, Ernest E., 4,506,312, Cl. 361-240.000.

Wullenkord, Kurt, to Holter Regelarmaturen GmbH & Co. Kg. Steam-pressure reduction valve. 4,505,865, Cl. 261-44.00R.

Wunderlich, Joachim: *See*—
Hanle, Edgar; Wunderlich, Joachim; Zwickl, Johann; and Haerdl, Stefan, 4,505,511, Cl. 296-93.000.

Wysong, Robert D.: *See*—
Moore, Herbert; Santos, Stephen; and Wysong, Robert D., 4,505,888, Cl. 424-1.100.

Xerox Corporation: *See*—
Billings, Philip A., 4,505,695, Cl. 493-459.000.
Brewington, Grace T.; Bolte, Steven B.; Hays, Dan; and Wayman, William H., 4,505,573, Cl. 355-3.0DD.

Kingsley, William; Stoffel, James C.; Moreland, John F., Jr.; Matteson, Ronald G.; Wiggins, Douglas G.; and Allis, Robert F., 4,506,301, Cl. 358-280.000.
Palumbo, Stephen A. J., 4,505,575, Cl. 355-14.00E.
Seedhouse, Frederick A.; and Green, Frederick A., 4,505,581, Cl. 355-58.000.
Yaegashi, Sakari: *See*—
Tanigawa, Takatoshi; Yaegashi, Sakari; Nakazawa, Tetsuo; Hatazi, Masahiko; and Nango, Tadao, 4,506,041, Cl. 523-139.000.
Yamada, Shinji; and Hanafusa, Saburo, to Oiles Industry Co., Ltd.; and Mitsuya Seiko Co. Ltd. Sliding member. 4,505,987, Cl. 428-553.000.
Yamada, Tetsusyo, to NGK Spark Plug Co., Ltd. Oxygen sensor. 4,505,806, Cl. 204-425.000.
Yamada, Tetsusyo, to NGK Spark Plug Co., Ltd. Oxygen sensor. 4,505,807, Cl. 204-425.000.
Yamada, Yasuji, to Sanraku-Ocean Co., Ltd. β-Aminoacid derivatives and process for production thereof. 4,506,085, Cl. 549-451.000.
Yamagata, Syuzi: *See*—
Suzuki, Takashi; Yamagata, Syuzi; and Osako, Jyunji, 4,505,354, Cl. 180-297.000.
Yamaguchi, Shunzo; Fukazawa, Takeshi; and Atsumi, Morihiro, to Nippondenso Co., Ltd. Exhaust gas cleaning apparatus. 4,505,107, Cl. 60-303.000.
Yamaguchi, Yoshiharu: *See*—
Yoshida, Hiroshi; and Yamaguchi, Yoshiharu, 4,505,009, Cl. 24-433.000.
Yamaguchi, Yuki: *See*—
Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,505,739, Cl. 71-92.000.
Yamaki, Kazuyoshi: *See*—
Sugino, Yoshihide; Tsumura, Takashi; Nakamura, Junnosuke; and Yamaki, Kazuyoshi, 4,505,636, Cl. 414-736.000.
Yamamiya, Kunio: *See*—
Yoshikawa, Shoji; Ohshima, Ken; Kodama, Hiroshi; Yamamiya, Kunio; Sakamoto, Masaharu; and Kato, Kiichi, 4,505,585, Cl. 356-237.000.
Yamamoto, Hisao; and Kogiso, Osamu, to Takemotoyushi Co. Ltd. Lubricant for treating synthetic fibers. 4,505,956, Cl. 427-393.100.
Yamamoto, Hitoshi: *See*—
Furusawa, Kahei; Nunokawa, Makoto; Ejiri, Yoshihiro; Yamamoto, Hitoshi; Yamazaki, Yoshihiko; and Tatekura, Koichi, 4,505,540, Cl. 350-96.200.
Yamamoto, Kazuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Document information filing system. 4,506,342, Cl. 364-900.000.
Yamamoto, Kiyoshi: *See*—
Urano, Shigeru; Yamamoto, Kiyoshi; Takagi, Yoshiaki; and Sugawara, Takeshi, 4,505,988, Cl. 428-569.000.
Yamamoto, Naoki: *See*—
Kobayashi, Nobuyoshi; Iwata, Seiichi; Yamamoto, Naoki; Matsuo, Hitoshi; and Homma, Teiichi, 4,505,028, Cl. 29-578.000.
Yamamoto, Toru: *See*—
Ariga, Yoshio; Ishige, Yoshiki; Satoh, Shogi; Tegawa, Masao; Kinugasa, Toshiyuki; and Yamamoto, Toru, 4,505,774, Cl. 156-499.000.
Yamamuro, Kiyohiko: *See*—
Nakajima, Junya; Itoh, Isamu; Yamamuro, Kiyohiko; and Ogawa, Eiiti, 4,506,007, Cl. 430-393.000.
Yamanaka, Junichi; and Nishino, Taizou, to Tokyo Shibaura Denki Kabushiki Kaisha. Color television camera apparatus. 4,506,287, Cl. 358-21.00R.
Yamane, Masataka; Kusashio, Akira; Kudaka, Satoru; Kobayashi, Tatuhiro; and Ebata, Yasuhiko, to Matsushita Electric Industrial Co., Ltd. Solid air-conditioning machine. 4,505,129, Cl. 62-280.000.
Yamanobe, Yoichiro: *See*—
Fukuda, Hiroyuki; Kaji, Hisatsugu; Fujimaki, Hiroto; Yamanobe, Yoichiro; Hiruta, Masaru; and Ohmi, Sigeru, 4,506,028, Cl. 502-101.000.
Yamashita, Iwao: *See*—
Tomiyori, Takashi; Fukuda, Misao; Yamashita, Iwao; Simizu, Nobuo; and Kumano, Takeshi, 4,505,073, Cl. 51-165.00R.
Yamashita, Sadahiko: *See*—
Makimoto, Mitsuo; Aihara, Yukichi; and Yamashita, Sadahiko, 4,506,241, Cl. 333-222.000.
Yamashita, Shigeo: *See*—
Chinone, Naoki; Kashiwada, Yasutoshi; Yamashita, Shigeo; and Aiki, Kunio, 4,506,366, Cl. 372-45.000.
Yamatake Honeywell Co., Ltd.: *See*—
Sugino, Yoshihide; Tsumura, Takashi; Nakamura, Junnosuke; and Yamaki, Kazuyoshi, 4,505,636, Cl. 414-736.000.
Yamazaki, Shunpei. Method of manufacturing a multiple-layer, non-single-crystalline semiconductor on a substrate. 4,505,950, Cl. 427-38.000.
Yamazaki, Yoshihiko: *See*—
Furusawa, Kahei; Nunokawa, Makoto; Ejiri, Yoshihiro; Yamamoto, Hitoshi; Yamazaki, Yoshihiko; and Tatekura, Koichi, 4,505,540, Cl. 350-96.200.
Yana, Masasumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Thermal transfer color printer and a method relating thereto. 4,505,603, Cl. 400-120.000.
Yanagishita, Hitoshi: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,506,107, Cl. 174-25.00C.
Yanaki, Toshio: *See*—
Kojima, Takemasa; Tabata, Kengo; Yanaki, Toshio; and Mitani, Mitsuaki, 4,505,757, Cl. 127-36.000.
Yang, Tai-Her. Liquid mixing valve. 4,505,301, Cl. 137-625.410.
Yannas, Ioannis V.; and Burke, John F., to Massachusetts Institute of Technology. Method of using a fibrous lattice. 4,505,266, Cl. 128-1.00R.
Yano, Kozo: *See*—
Hamada, Hiroshi; Take, Hiroshi; Yano, Kozo; and Inami, Yasuhiko, 4,505,021, Cl. 29-570.000.
Yantsen, Ivan A.; Bekishev, Kenes K.; Savchak, Orest G.; Klok, Alexandr B.; Zhanabaev, Tolgat M.; Pakshtas, Mechislav-Valentinas K.; Glotov, Boris N.; Fink, Garold K.; Timkin, Alexei F.; Zorin, Nikolai I.; and Bobylev, Leonid M. Hydropneumatic percussive tool. 4,505,340, Cl. 173-134.000.
Yashima, Nobuyoshi, to Mitsui Engineering & Shipbuilding Co., Ltd. Marine riser protector for use on offshore oil drilling rigs in icy waters. 4,505,618, Cl. 405-211.000.
Yasuhara, Seishi, to Nissan Motor Company, Limited. Engine lubricating oil replacement timing monitoring system and method for an automotive vehicle. 4,506,337, Cl. 364-550.000.
Yau, Lee. D.: *See*—
Bohr, Mark T.; Yu, Ken K.; Yau, Leo D.; and Garg, Shyam G., 4,505,026, Cl. 29-577.00C.
Yazu, Shuji: *See*—
Nakai, Tetsuo; and Yazu, Shuji, 4,505,746, Cl. 75-243.000.
Yee, Gin W.: *See*—
Bogert, Warren D.; Kiss, Marvin L.; and Yee, Gin W., 4,506,264, Cl. 343-18.00E.
Yokoyama, Yasumasa: *See*—
Kanekiyo, Kazue; Kobayashi, Masatsune; Yokoyama, Yasumasa; Eida, Tsuyoshi; Komori, Tomoko; and Koike, Shoji, 4,505,749, Cl. 106-20.000.
Yoneda, Kou: *See*—
Sawada, Takeshi; Yoneda, Kou; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, 4,506,220, Cl. 324-252.000.
Yoon, Yu Taek. Light collecting type of solar energy collecting system. 4,505,258, Cl. 126-424.000.
Yoshida, Hiroshi; and Yamaguchi, Yoshiharu, to Yoshida Kogyo K.K. Slide fastener with a separator attached thereto. 4,505,009, Cl. 24-433.000.
Yoshida Industry Co., Ltd.: *See*—
Sugiyama, Takashi, 4,505,607, Cl. 401-78.000.
Yoshida, Kazuhiro: *See*—
Hibino, Takashi; Naruse, Nobutaka; and Yoshida, Kazuhiro, 4,505,130, Cl. 62-347.000.
Yoshida Kogyo K.K.: *See*—
Chijiishi, Toshio; Matoba, Hiroshi; Nakamura, Kazuo; and Higuchi, Toshiaki, 4,505,659, Cl. 425-121.000.
Yoshida, Hiroshi; and Yamaguchi, Yoshiharu, 4,505,009, Cl. 24-433.000.
Yoshikawa, Kiichi, 4,505,008, Cl. 24-401.000.
Yoshida, Kokichi; Niinobe, Takao; and Baba, Takashi, to Takeda Chemical Industries, Ltd. Production of p-aminobenzoylglutamic acid by electrochemical reduction. 4,505,788, Cl. 204-74.000.
Yoshida, Takao: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,506,104, Cl. 568-820.000.
Yoshida, Tokuichiro. Automatic transmission mechanism with spindle-shaped frictional clutch members incorporated therein. 4,505,164, Cl. 74-371.000.
Yoshida, Yuji: *See*—
Hokamura, Sadakazu; Shinohara, Toshio; Nomura, Ryoichi; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,505,954, Cl. 427-380.000.
Yoshihara, Junji: *See*—
Niwa, Toshio; Himeno, Kiyoshi; and Yoshihara, Junji, 4,505,715, Cl. 8-639.000.
Yoshii, Osamu, to Suyehiro, Hito. Orthodontic treating device and method of manufacturing same. 4,505,673, Cl. 433-6.000.
Yoshikawa, Kiichi, to Yoshida Kogyo K.K. Adjustable fastener. 4,505,008, Cl. 24-401.000.
Yoshikawa, Shoji; Ohshima, Ken; Kodama, Hiroshi; Yamamiya, Kunio; Sakamoto, Masaharu; and Kato, Kiichi, to Oiympus Optical Co., Ltd. System for detecting defects on an optical surface. 4,505,585, Cl. 356-237.000.
Yoshimatsu, Yoshiaki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Arc furnace installation with shroud. 4,506,370, Cl. 373-8.000.
Yoshimi, Kazuhiko: *See*—
Endo, Yoichi; Nakanishi, Kazuo; Namura, Hideki; Doi, Terukazu; Kusumoto, Katsunori; Shimizu, Kazuyuki; Yoshimi, Kazuhiko; Nagai, Shigeru; and Sato, Shoichi, 4,505,217, Cl. 114-103.000.
Yoshino Kogyosho Co., Ltd.: *See*—
Sato, Nobuo, 4,505,372, Cl. 198-404.000.
Yoshino, Takeshi: *See*—
Hara, Hiroshi; Tobioka, Takashi; Nishizawa, Tetuo; and Yoshino, Takeshi, 4,505,562, Cl. 354-203.000.
Yoshioka, Yukio: *See*—
Shinoda, Akibumi; Yoshioka, Yukio; and Kato, Akio, 4,505,635, Cl. 414-667.000.
Yoshiyuki, Sasaki; and Mitsuo, Matsumoto, to Teijin Limited. Heat-durable spun-like fasciated yarn and method for producing the same. 4,505,100, Cl. 57-207.000.
Yoshizaki, Hideo: *See*—
Mori, Toshihito; Yoshizaki, Hideo; and Hasegawa, Akio, 4,505,893, Cl. 424-94.000.
Young, Colin G., to EMCO Wheaton International Limited. Fuel control system for gaseous fueled engines. 4,505,249, Cl. 123-527.000.

Young, James R.; and VanBreemen, Bertram, to RCA Corporation. Projection television receiver with unitary optics frame. 4,506,295, Cl. 358-60.000.

Yu, Ken K.: *See*—
Bohr, Mark T.; Yu, Ken K.; Yau, Leo D.; and Garg, Shyam G., 4,505,026, Cl. 29-577.00C.

Yum, Daniel, to Burroughs Corporation. Low power partitioned PLA. 4,506,173, Cl. 307-466.000.

Yusa, Hideo: *See*—
Funabashi, Kiyomi; Kawamura, Fumio; Kikuchi, Makoto; and Yusa, Hideo, 4,505,851, Cl. 252-628.000.

Yuzawa, Haruo; and Sunamura, Kazuhiro, to Nissan Motor Company, Limited. Hot-wire air flowmeter control system for engine. 4,505,248, Cl. 123-519.000.

Zabel, Klaus H.: *See*—
Geerdes, Dirk J. F.; and Zabel, Klaus H., 4,505,986, Cl. 428-481.000.

Zabler, Erich: *See*—
Rothley, Manfred; Zabler, Erich; Neuffer, Kurt; and Reinhart, Karl-Franz, 4,506,217, Cl. 324-208.000.

Zacharias, Ellis M., Jr., to Nusonics, Inc. High-temperature transducer. 4,505,160, Cl. 73-861.180.

Zahedi, Karim; Alexander, Jeffrey C.; and Zieve, Peter B., to EFB Inc. Filter apparatus. 4,505,723, Cl. 55-117.000.

Zajac, Chester J., to Transamerica DeLaval, Inc. Leak detection system. 4,505,148, Cl. 73-49.200.

Zatorski, Raymond A.: *See*—
Smyth, Richard T.; and Zatorski, Raymond A., 4,506,136, Cl. 219-121.0PL.

Zeev, Ya'acov B.: *See*—
Henquin, Teodor; and Zeev, Ya'acov B., 4,506,359, Cl. 370-81.000.

Zeitler, Karl-Heinz: *See*—
Auracher, Franz; Buerk, Hermann; Keil, Rudolf; Stockmann, Michael; Weingand, Kaspar; and Zeitler, Karl-Heinz, 4,505,539, Cl. 350-96.150.

Zeller Corporation, The: *See*—
Mazziotti, Philip J., 4,505,689, Cl. 464-130.000.

Zeller, Josef, to Concast Service Union AG. Method of, and apparatus for, cooling and supporting a strand in a plate mold of a continuous casting installation, especially for casting steel strands. 4,505,321, Cl. 164-491.000.

Zeltner, Larry D.: *See*—
Salmon, Stuart C.; and Zeltner, Larry D., 4,505,075, Cl. 51-165.750.

Zerod, Richard D.: *See*—
Charboneau, Ben J.; and Zerod, Richard D., 4,506,258, Cl. 340-618.000.

Zettler, Karl-Heinz, to Westfalia Separator AG. Centrifuge with a self-emptying drum. 4,505,700, Cl. 494-30.000.

Zettler, Hans-Dieter: *See*—
Ihbe, Jorg; Taubenmann, Peter; Thiele, Heino; and Zettler, Hans-Dieter, 4,505,592, Cl. 366-134.000.

Zeugner, Horst; Ruhland, Michael; Liepmann, Hans; Milkowski, Wolfgang; and Muesch, Herbert, to Kali-Chemie Pharma GmbH. 7-Bromo-5-(2-halophenyl)-1H-2,3-dihydro-1,4-benzodiazepine pharmaceuticals. 4,505,908, Cl. 514-221.000.

Zhanabaev, Tolgat M.: *See*—
Yantsen, Ivan A.; Bekishev, Kenes K.; Savchak, Orest G.; Klok, Alexandr B.; Zhanabaev, Tolgat M.; Pakshtas, Mechislav-Valentinas K.; Glotov, Boris N.; Fink, Garold K.; Timkin, Alexei F.; Zorin, Nikolai I.; and Bobylev, Leonid M., 4,505,340, Cl. 173-134.000.

Zieg, Steven A., to Mansion Industries, Inc. Railing and baluster connection. 4,505,456, Cl. 256-67.000.

Ziemek, Gerhard; Schatz, Friedrich; Muller, Dieter; and Rowell, Douglas W., to kabelmetal electro Gesellschaft mit beschrankter Haftung. Method and apparatus for manufacturing heat exchanger tubes. 4,506,135, Cl. 219-107.000.

Zieve, Peter B.: *See*—
Zahedi, Karim; Alexander, Jeffrey C.; and Zieve, Peter B., 4,505,723, Cl. 55-117.000.

Zimpro Inc.: *See*—
Schuck, Jack K.; and Adams, Neal J., 4,505,210, Cl. 110-336.000.

Zipperle, Wolfgang. Rain protective molding for automobiles. 4,505,965, Cl. 428-122.000.

Zippwald, John C., Sr. Playing card cleaning apparatus. 4,504,995, Cl. 15-102.000.

Ziselman, Boris G.: *See*—
Makarov, Viktor M.; Paton, Boris E.; Globin, Nikolai K.; Usenko, Viktor G.; Khismatulin, Enver R.; Ziselman, Boris G.; Serov, Petr G.; Shel, Marat M.; and Rozenberg, Ovshiya O., 4,505,417, Cl. 228-17.700.

Zoleski, Benjamin H.: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; Herbstman, Sheldon; and Dorn, Peter, 4,505,835, Cl. 252-51.50A.

Zomeworks Corporation: *See*—
Baer, Stephen C., 4,505,255, Cl. 126-419.000.

Zondler, Rolf: *See*—
Tischer, Kurt M.; Voigt, Klaus-Peter; and Zondler, Rolf, 4,505,685, Cl. 445-24.000.

Zorin, Nikolai I.: *See*—
Yantsen, Ivan A.; Bekishev, Kenes K.; Savchak, Orest G.; Klok, Alexandr B.; Zhanabaev, Tolgat M.; Pakshtas, Mechislav-Valentinas K.; Glotov, Boris N.; Fink, Garold K.; Timkin, Alexei F.; Zorin, Nikolai I.; and Bobylev, Leonid M., 4,505,340, Cl. 173-134.000.

Zuleeg, Rainer; and Notthoff, Johannes K., to United States of America, Air Force. Self-detecting optical sensors. 4,505,582, Cl. 356-5.000.

Zust, John E. Weft cutting device for a loom. 4,505,304, Cl. 139-302.000.

Zweifel, Hans: *See*—
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,505,794, Cl. 204-159.240.
Kvita, Vratislav; Zweifel, Hans; Roth, Martin; and Felder, Louis, 4,506,083, Cl. 549-27.000.

Zwickl, Johann: *See*—
Hanle, Edgar; Wunderlich, Joachim; Zwickl, Johann; and Haerdl, Stefan, 4,505,511, Cl. 296-93.000.

Zydney, Herbert M.: *See*—
Bennett, Joseph M.; Gordon, Alan M.; Silverio, Vincent J.; and Zydney, Herbert M., 4,506,346, Cl. 364-900.000.

118343 Canada Inc.: *See*—
Nguyen, Hai N., 4,505,257, Cl. 126-432.000.

501 Loomhurst Limited: *See*—
Bridges, Robert E., 4,505,427, Cl. 236-54.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF MARCH, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Analog Devices, Incorporated: *See*—
Pastoriza, James J., Re. 31,850, Cl. 340-347.0DA.

Bachman, Wesley J., to Dickey-john Corporation. Signal processing system. Re. 31,851, Cl. 343-8.000.

Dickey-john Corporation: *See*—
Bachman, Wesley J., Re. 31,851, Cl. 343-8.000.

Klein, Max. Porous media to separate gases liquid droplets and/or solid particles from gases or vapors and coalesce entrained droplets. Re. 31,849, Cl. 55-389.000.

Pastoriza, James J., to Analog Devices, Incorporated. Solid state digital-to-analog converter. Re. 31,850, Cl. 340-347.0DA.

Soderblom, Olof, to Willemijn Houdstermaatschappij BV. Data transmission system. Re. 31,852, Cl. 370-90.000.

Willemijn Houdstermaatschappij BV: *See*—
Soderblom, Olof, Re. 31,852, Cl. 370-90.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bergstrom, Lennart; and Warden, Hans E., to Siemens AG. X-ray devices using epoxy resins strengthened with carbonic fibrous material. B1 4,146,793, 3-19-85, Cl. 378-161.000.

Bio-Energy Systems, Inc.: *See*—
MacCracken, Calvin D., B1 4,112,921, Cl. 126-448.000.

Campbell, Roy E.; Lawrence, John B.; and Tonne, Ronald R., to Ortloff Corporation, The. Natural gas processing. B1 4,061,481, 3-19-85, Cl. 62-29.000.

Digital Magnetic Systems, Inc.: *See*—
McNew, Thomas A., B1 4,270,911, Cl. 493-410.000.

Dlugos, Daniel F.; and Harenberg, Donald D., to Pitney Bowes Inc.; and Rockwell Intl. Corp. Serial data bus for use in a multiprocessor parcel postage metering system. B1 4,271,470, 3-19-85, Cl. 364-466.000.

Fredericks, Walter A., to Rexnord, Inc. Torque transmission coupling. B1 4,055,966, 3-19-85, Cl. 464-99.000.

Harenberg, Donald D.: *See*—
Dlugos, Daniel F.; and Harenberg, Donald D., B1 4,271,470, Cl. 364-466.000.

Lawrence, John B.: *See*—
Campbell, Roy E.; Lawrence, John B.; and Tonne, Ronald R., B1 4,061,481, Cl. 62-29.000.

MacCracken, Calvin D., to Bio-Energy Systems, Inc. Method and system for utilizing a flexible tubing solar collector. B1 4,112,921, 3-19-85, Cl. 126-448.000.

McNew, Thomas A., to Digital Magnetic Systems, Inc. Method and system for providing elongated Z-fold copy paper. B1 4,270,911, 3-19-85, Cl. 493-410.000.

Ortloff Corporation, The: *See*—
Campbell, Roy E.; Lawrence, John B.; and Tonne, Ronald R., B1 4,061,481, Cl. 62-29.000.

Pitney Bowes Inc.: *See*—
Dlugos, Daniel F.; and Harenberg, Donald D., B1 4,271,470, Cl. 364-466.000.

Rexnord, Inc.: *See*—
Fredericks, Walter A., B1 4,055,966, Cl. 464-99.000.

Rockwell Intl. Corp.: *See*—
Dlugos, Daniel F.; and Harenberg, Donald D., B1 4,271,470, Cl. 364-466.000.

Shivvers, Charles C. Sweep auger structure. B1 3,765,548, 3-19-85, Cl. 414-310.000.

Siemens AG: *See*—
Bergstrom, Lennart; and Warden, Hans E., B1 4,146,793, Cl. 378-161.000.

Tonne, Ronald R.: *See*—
Campbell, Roy E.; Lawrence, John B.; and Tonne, Ronald R., B1 4,061,481, Cl. 62-29.000.

Warden, Hans E.: *See*—
Bergstrom, Lennart; and Warden, Hans E., B1 4,146,793, Cl. 378-161.000.

LIST OF DESIGN PATENTEES

Adams, Ladd M.: *See*—
Puckett, William E.; and Adams, Ladd M., 278,047, Cl. D13-5.000.

Akutagawa Confectionary Co., Ltd.: *See*—
Sekiyama, Masao, 277,994, Cl. D1-106.000.

American Commercial, Incorporated: *See*—
Laslo, Larry R., 278,013, Cl. D7-1.000.
Laslo, Larry R., 278,015, Cl. D7-5.000.

American Standard Inc.: *See*—
Kaiser, Jack N., 278,078, Cl. D23-65.000.

Ampex Corporation: *See*—
Wilson, George A., 278,062, Cl. D14-108.000.

Aoco Limited/Limitee: *See*—
Pruefer, Erwin, 278,087, Cl. D29-9.000.

Arimura, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Cassette player. 278,051, 3-19-85, Cl. D14-6.000.

Ash, William F., to Shopsmith, Inc. Push stick for a saw table or the like. 278,022, 3-19-85, Cl. D8-14.000.

Astle, William H., to Tri Tool, Inc. Portable pipe end preparation tool. 278,026, 3-19-85, Cl. D8-61.000.

AT&T Bell Laboratories: *See*—
Genaro, Donald M.; Gotway, Jerome M.; Hall, Norris R.; and McGarvey, John N., 278,056, Cl. D14-60.000.

Avery, Steven P. Automobile. 278,043, 3-19-85, Cl. D12-92.000.

Barber, Eugene: *See*—
Menn, Walter A.; Sarkis, Alexander, Jr; Haskins, Steve W.; Barber, Eugene; and Sharp, James M., 278,053, Cl. D14-53.000.

Bayerische Motoren Werke A. G.: *See*—
Kerschbaum, Hans, 278,046, Cl. D12-181.000.

Bollinger, Bob: *See*—
Suponitsky, Lenny, 278,029, Cl. D8-397.000.

Bollinger, Glenn: *See*—
Suponitsky, Lenny, 278,029, Cl. D8-397.000.

Borkan, Florence; and Cafiero, Thomas A., to Pharmacaps, Inc. Combined receptacle cap and capsule piercing device therefor. 278,033, 3-19-85, Cl. D9-437.000.

Borkan, Florence: *See*—
Cafiero, Thomas A.; and Borkan, Florence, 278,034, Cl. D9-437.000.

Bowen, Dewey L. Vibrato tail piece. 278,067, 3-19-85, Cl. D17-14.000.

Brenner, Stanley; Pearse, James N.; and Johnson, George E., to Leviton Manufacturing Co. Inc. Thermal detector. 278,050, 3-19-85, Cl. D13-34.000.

Breyer-Lindner, Brigitte. Hanging ornament. 278,042, 3-19-85, Cl. D11-125.000.

Cafiero, Thomas A.; and Borkan, Florence, to Pharmacaps, Inc. Combined receptacle cap and capsule piercing device therefor. 278,034, 3-19-85, Cl. D9-437.000.

Cafiero, Thomas A.: *See*—
Borkan, Florence; and Cafiero, Thomas A., 278,033, Cl. D9-437.000.

Camp International, Inc.: *See*—
Meier, Robert H., 278,083, Cl. D24-64.000.

Chamberlain, Edward; Hardy, Tommy R.; Leon, Nicholas M.; Mendel, Peter J.; and Sharp, Michael H., to International Business Machines Corporation. Keyboard enclosure for a personal computer or the like. 278,063, 3-19-85, Cl. D14-100.000.

Chan, David M. F.; and Chan, Michael L. F. Suspended holder for plants, candles or the like. 278,008, 3-19-85, Cl. D6-514.000.

Chan, Michael L. F.: *See*—
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Clarke, Frank M., to TI! Electronics, Inc. Electronic tester or the like. 278,041, 3-19-85, Cl. D10-75.000.

Collymore, Emily J. Toilet tissue holding device or the like. 278,007, 3-19-85, Cl. D6-523.000.

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Conley, William J. Divining rod. 278,040, 3-19-85, Cl. D10-46.000.

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Desrochers, Franklin J., to Universal Data, Inc. Combined portable data entry terminal and expansion base therefor. 278,059, 3-19-85, Cl. D14-100.000.

Doerner, Frank. Cover for chair leg. 278,012, 3-19-85, Cl. D6-495.000.

Drummond, Daniel, to Lever Brothers Company. Combined bottle and cap. 278,030, 3-19-85, Cl. D9-376.000.

Dryden, Darwin E. Plant irrigator. 278,075, 3-19-85, Cl. D23-1.000.

Dryden, Darwin E. Root irrigator. 278,076, 3-19-85, Cl. D23-1.000.

Elmburg, John R., to U.S. Metal Container Company. Fuel container. 278,031, 3-19-85, Cl. D9-376.000.

Everhan, Walter. Cream pitcher. 278,019, 3-19-85, Cl. D7-319.000.

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Greenberg, Isadore M. Eyelid accessory or similar article. 278,086, 3-19-85, Cl. D28-92.000.

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51	4,505,716
53	4,505,717
66	4,505,718
	4,505,725

CLASS 47

17	4,505,066
57.5	4,505,067
59	4,505,068

CLASS 48

202	4,505,719

CLASS 49

64	4,505,069
83	4,505,070

CLASS 51

3	4,505,071
164.2	4,505,072
165 R	4,505,073
165.75	4,505,075
165.77	4,505,074
206.5	4,505,076
295	4,505,720
309	4,505,721
415	4,505,077

CLASS 52

36	4,505,078
202	4,505,079
211	4,505,080
223 L	4,505,081
309.8	4,505,082
476	4,505,083
528	4,505,084
582	4,505,085
593	4,505,086
741	4,505,087
747	4,505,088

CLASS 53

48	4,505,089
137	4,505,090
444	4,505,091
504	4,505,092
531	4,505,093

CLASS 55

89	4,505,722
117	4,505,723
118	4,505,724
282	4,505,726
387	4,505,727
389	Re.31,849

CLASS 56

10.2	4,505,094
202	4,505,095
328 R	4,505,096

CLASS 57

22	4,505,097
	4,505,098
86	4,505,099
207	4,505,100
301	4,505,101
408	4,505,102

CLASS 59

85	4,505,103

CLASS 60

39.091	4,505,104
200.1	4,505,105
286	4,505,106
303	4,505,107
327	4,505,108
384	4,505,110
386	4,505,109
431	4,505,111
533	4,505,112
535	4,505,113
554	4,505,114
562	4,505,115
	4,505,116
609	4,505,117

CLASS 62

3	4,505,118
6	4,505,119
29	B1 4,061,481
48	4,505,120
60	4,505,121
133	4,505,122
148	4,505,123
180	4,505,124
209	4,505,125
239	4,505,126
271	4,505,127
272	4,505,128
280	4,505,129
347	4,505,130
407	4,505,131
457	4,505,132
476	4,505,133
542	4,505,728

CLASS 65

3.11	4,505,729
162	4,505,730
225	4,505,731

CLASS 66

60 R	4,505,134
157	4,505,135
168	4,505,136

CLASS 68

62	4,505,137
208	4,505,138

CLASS 70

221	4,505,139
424	4,505,140

CLASS 71

11	4,505,732
34	4,505,733
67	4,505,734
76	4,505,736
86	4,505,737
88	4,505,738
92	4,505,739
	4,505,740
	4,505,741
93	4,505,742
94	4,505,743
086	4,505,735

CLASS 72

38	4,505,141
54	4,505,142
187	4,505,143
260.5	4,505,337
345	4,505,144
457	4,505,145

CLASS 73

19	4,505,146
29	4,505,147
49.2	4,505,148
53	4,505,149
116	4,505,150
	4,505,151
117.2	4,505,152
117.4	4,505,153
150 R	4,505,154
151	4,505,155
626	4,505,156
756	4,505,157
766	4,505,158
847	4,505,159
861.18	4,505,160
863	4,505,161

CLASS 74

41	4,505,162
63	4,505,163
371	4,505,164
471 XY	4,505,165
479	4,505,166
577 R	4,505,167
687	4,505,168
858	4,505,169

CLASS 75

120	4,505,744
129	4,505,745
243	4,505,746
251	4,505,747

CLASS 81

177 B	4,505,171
464	4,505,170

CLASS 83

74	4,505,172
112	4,505,173
455	4,505,174
703	4,505,175
808	4,505,176

CLASS 84

329	4,505,177
465	4,505,178

CLASS 89

1 G	4,505,179
8	4,505,180
33.04	4,505,181
132	4,505,182
191.01	4,505,183

CLASS 91

39	4,505,184
491	4,505,185

CLASS 92

5 R	4,505,186
31	4,505,187
94	4,505,188

CLASS 98

40.19	4,505,189
115.1	4,505,190

CLASS 99

300	4,505,191
330	4,505,192
	4,505,193
336	4,505,194
427	4,505,195
519	4,505,196

CLASS 100

5	4,505,197

CLASS 101

40	4,505,198
127.1	4,505,199

CLASS 102

293	4,505,200
324	4,505,201
357	4,505,202
382	4,505,203
523	4,505,204

CLASS 104

139	4,505,205
284	4,505,206

CLASS 105

163 SK	4,505,207

CLASS 106

14.39	4,505,748
20	4,505,749
38.35	4,505,750
84	4,505,751
85	4,505,752
90	4,505,753
238	4,505,754
308 B	4,505,755

CLASS 109

85	4,505,208

CLASS 110

245	4,505,209
336	4,505,210
346	4,505,211

CLASS 112

118	4,505,212
315	4,505,213

CLASS 114

29	4,505,214
	4,505,215
39	4,505,216
103	4,505,217

CLASS 116

200	4,505,218
234	4,505,219

CLASS 118

16	4,505,220
101	4,505,221
304	4,505,222
401	4,505,223
636	4,505,224
669	4,505,225

CLASS 119

1	4,505,226
52 R	4,505,227
62	4,505,228
158	4,505,229

CLASS 122

4 D	4,505,230
159	4,505,231
511	4,505,232

CLASS 123

41.35	4,505,233
41.84	4,505,234
90.17	4,505,235
90.27	4,505,236
179 G	4,505,237
193 CH	4,505,238
197 AC	4,505,239
357	4,505,240
373	4,505,241
383	4,505,242
446	4,505,243
447	4,505,244
451	4,505,245
489	4,505,246
500	4,505,247
519	4,505,248
527	4,505,249
540	4,505,250

CLASS 125

15	4,505,251

CLASS 126

246	4,505,252
351	4,505,253
367	4,505,254
419	4,505,255
422	4,505,256
424	4,505,258
429	4,505,259
432	4,505,257
433	4,505,260
	4,505,261
435	4,505,262
438	4,505,263
439	4,505,264
448	B1 4,112,921

CLASS 127

29	4,505,756
36	4,505,757

CLASS 128

1 R	4,505,265
	4,505,266
49	4,505,267
69	4,505,268
87 R	4,505,269
88	4,505,270
157	4,505,271
305	4,505,272
335	4,505,273
337	4,505,274
421	4,505,275
697	4,505,276
769	4,505,277
774	4,505,278

CLASS 130

27 T	4,505,279

CLASS 131

94	4,505,280
105	4,505,281
334	4,505,282

CLASS 132

45 R	4,505,283

CLASS 134

1	4,505,758
104	4,505,284

CLASS 135

20 R	4,505,285
90	4,505,286

CLASS 137

12	4,505,287
59	4,505,288
68 R	4,505,289
74	4,505,290
77	4,505,291
117	4,505,293
240	4,505,292
241	4,505,294
315	4,505,295
510	4,505,296
540	4,505,298
561 A	4,505,297
596.1	4,505,299
614.14	4,505,300
625.41	4,505,301

CLASS 138

97	4,505,302
149	4,505,303

CLASS 139

302	4,505,304
435	4,505,306
448	4,505,305

CLASS 141

1	4,505,307
59	4,505,308
97	4,505,309
114	4,505,310
129	4,505,311
326	4,505,312

CLASS 145

29 R	4,505,313

CLASS 148

1.5	4,505,759
6.15 R	4,505,760
9 R	4,505,761
11.5 R	4,505,762
127	4,505,763
133	4,505,764
171	4,505,765
175	4,505,766
402	4,505,767

CLASS 152

398	4,505,314

CLASS 156

153	4,505,768
217	4,505,769
235	4,505,770
285	4,505,771
355	4,505,772

384 4,505,773
499 4,505,774
507 4,505,780
640 4,505,781
643 4,505,782

CLASS 157

1.5 4,505,315

CLASS 162

9 4,505,775
51 4,505,776
102 4,505,777
135 4,505,778
199 4,505,779

CLASS 164

37 4,505,316
113 4,505,318
153 4,505,317
432 4,505,319
440 4,505,320
491 4,505,321

CLASS 165

1 4,505,322
11 A 4,505,323
42 4,505,324
45 4,505,325
4,505,326
48 R 4,505,327
53 4,505,328
81 4,505,329
119 4,505,330

CLASS 166

117.5 4,505,331
120 4,505,332
267 4,505,333
284 4,505,334

CLASS 169

76 4,505,335
85 4,505,336

CLASS 172

611 4,505,338
812 4,505,339

CLASS 173

134 4,505,340

CLASS 174

25 C 4,506,107
52 FP 4,506,108
128 S 4,506,109
144 4,506,110

CLASS 175

65 4,505,341
329 4,505,342
409 4,505,343

CLASS 177

136 4,505,344
211 4,505,345

CLASS 179

2 A 4,506,111
81 A 4,506,114
81 B 4,506,113
81 R 4,506,112
84 C 4,506,115
90 BD 4,506,116
114 R 4,506,117

CLASS 180

7.4 4,505,346
14.2 4,505,347
89.14 4,505,348
136 4,505,349
143 4,505,350
169 4,505,351
219 4,505,352
235 4,505,353
297 4,505,354
308 4,505,355
322 4,505,356
335 4,505,357

CLASS 181

18 4,505,358

CLASS 187

9 R 4,505,359
29 R 4,505,360

CLASS 188

26 4,505,361
67 4,505,362
72.5 4,505,363

CLASS 192

0.02 R 4,505,364
0.092 4,505,368
3.29 4,505,365
18 B 4,505,366
58 B 4,505,367
98 4,505,369

CLASS 194

4 C 4,505,370

CLASS 198

382 4,505,371
404 4,505,372
432 4,505,373
448 4,505,374
482 4,505,375
520 4,505,376
624 4,505,377
710 4,505,378
731 4,505,379
750 4,505,380
781 4,505,381
819 4,505,382
853 4,505,383

CLASS 200

1 R 4,506,118
16 C 4,506,119
42 R 4,506,120
50 B 4,506,121
61.58 R 4,506,122
83 J 4,506,123
153 J 4,506,124

CLASS 204

1 T 4,505,783
4,505,784
4,505,785
38.4 4,505,786
67 4,505,787
74 4,505,788
128 4,505,789
130 4,505,790
157.1 R 4,505,791
159.11 4,505,792
159.16 4,505,793
159.24 4,505,794
179 4,505,795
243 R 4,505,796
252 4,505,797
298 4,505,798
416 4,505,799
418 4,505,800
4,505,801
425 4,505,802
4,505,803
4,505,804
4,505,805
4,505,806
4,505,807

CLASS 206

45.33 4,505,384
260 4,505,385
315.11 4,505,386
414 4,505,387
425 4,505,388
460 4,505,389
547 4,505,390
622 4,505,391

CLASS 208

11 R 4,505,808
4,505,809
108 4,505,810

CLASS 209

17 4,505,811
275 4,505,812

CLASS 210

86 4,505,813
166 4,505,814
223 4,505,815
439 4,505,816
484 4,505,817
502.1 4,505,818
603 4,505,819
604 4,505,820
611 4,505,821
635 4,505,822
668 4,505,823
695 4,505,824

CLASS 211

26 4,505,392
41 4,505,393
4,505,394
126 4,505,395

CLASS 212

223 4,505,396
232 4,505,397

CLASS 215

11 B 4,505,398
230 4,505,399
250 4,505,400
252 4,505,401

CLASS 219

10.53 4,506,125
4,506,126
10.55 B 4,506,127
10.55 F 4,506,128
10.77 4,506,131
10.79 4,506,132
69 C 4,506,133
69 W 4,506,129
73.1 4,506,130
100 4,506,134
107 4,506,135
121 PL 4,506,136
203 4,506,137
205 4,506,138
209 4,506,139
315 4,506,140
463 4,506,141
490 4,506,142
497 4,506,143
4,506,144
499 4,506,145
4,506,146

CLASS 220

1.5 4,505,402
242 4,505,403
339 4,505,404

CLASS 222

135 4,505,405
4,505,406
181 4,505,407
185 4,505,408
509 4,505,409
611 4,505,410

CLASS 224

39 4,505,411

CLASS 225

96 4,505,412

CLASS 226

108 4,505,413

CLASS 227

19 4,505,414
88 4,505,415
120 4,505,416

CLASS 228

17.7 4,505,417
122 4,505,418
183 4,505,419
212 4,505,420
224 4,505,421

CLASS 229

5.5 4,505,423
37 R 4,505,422
87 R 4,505,424
87.2 4,505,425

CLASS 235

95 B 4,506,147
380 4,506,148

CLASS 236

47 4,505,426
54 4,505,427

CLASS 238

349 4,505,428

CLASS 239

56 4,505,429
112 4,505,430
428 4,505,431

CLASS 241

29 4,505,432
46 R 4,505,433
79.1 4,505,435
89.3 4,505,434

CLASS 242

43 A 4,505,436
4,505,437
55 4,505,438
68.4 4,505,439
199 4,505,440

CLASS 244

3.15 4,505,441
4,505,442
12.5 4,505,443
122 AE 4,505,444
134 B 4,505,445

CLASS 248

205.8 4,505,446
216.1 4,505,447
313 4,505,448
669 4,505,449

CLASS 250

202 4,506,149
204 4,506,150
213 A 4,506,151
216 4,506,152
227 4,506,153
252.1 4,506,155
266 4,506,156
337 4,506,157
338 4,506,158
377 4,506,159
427 4,506,160
442.1 4,506,154
574 4,506,161

CLASS 251

24 4,505,450
285 4,505,451
326 4,505,452
328 4,505,453
367 4,505,454

CLASS 252

8.5 C 4,505,825
4,505,833
8.55 D 4,505,828
8.55 R 4,505,826
4,505,827
32.7 E 4,505,829
33 4,505,830
34 4,505,831
42.1 4,505,832
51.5 A 4,505,834
4,505,835
174.14 4,505,836
299.6 4,505,837
299.63 4,505,838
344 4,505,839
500 4,505,840
4,505,841
4,505,842
4,505,843
4,505,844
4,505,845
4,505,846
511 4,505,847
4,505,848
609 4,505,849
4,505,850
628 4,505,851

CLASS 254

89 H 4,505,455

CLASS 256

67 4,505,456

CLASS 260

112.5 R 4,505,852
4,505,853
4,505,854
123.7 4,505,855
239 R 4,505,858
453 A 4,505,860
453 P 4,505,85?
465 E 4,505,861
501.18 4,505,862

CLASS 261

34 A 4,505,863
40 4,505,864
44 R 4,505,865

CLASS 264

42 4,505,866
103 4,505,867
108 4,505,868
115 4,505,869
206 4,505,870
325 4,505,871

CLASS 267

3 4,505,457
9 B 4,505,458
46 4,505,459
54 R 4,505,460
140.1 4,505,461
140.2 4,505,462

CLASS 269

56 4,505,463
73 4,505,464
130 4,505,465

CLASS 270

31 4,505,466
53 4,505,467

CLASS 271

18.3 4,505,468
91 4,505,469
100 4,505,470
251 4,505,471

CLASS 272

1 C 4,505,472
73 4,505,473
75 4,505,474
118 4,505,475
146 4,505,476
4,505,477

CLASS 273

32 H 4,505,478
72 A 4,505,479
73 C 4,505,480
348.1 4,505,481
421 4,505,482

CLASS 277

34 4,505,483
94 4,505,484
96.1 4,505,485
235 B 4,505,486

CLASS 279

1 S 4,505,487
5 4,505,488

CLASS 280

47.13 R 4,505,489
63 4,505,490
91 4,505,491
284 4,505,492
617 4,505,493
618 4,505,494
651 4,505,495
804 4,505,496

CLASS 283

81 4,505,497
91 4,505,498

CLASS 285

42 4,505,499

CLASS 290

38 A 4,506,162
38 R 4,506,163

CLASS 292

48 4,505,500
62 4,505,501
251.5 4,505,502
315 4,505,503
337 4,505,504

CLASS 294

64.1 4,505,505
161 4,505,506

CLASS 296

1 S 4,505,507
39 R 4,505,508
63 4,505,509
70 4,505,510
93 4,505,511
98 4,505,512

CLASS 297

307 4,505,513
322 4,505,514
362 4,505,515

CLASS 299

2 4,505,516
31 4,505,517
34 4,505,518

CLASS 303

6 A 4,505,519
119 4,505,520

CLASS 307

264 4,506,164
272 A 4,506,165
277 4,506,166
279 4,506,167
290 4,506,168
351 4,506,169
355 4,506,170
362 4,506,171
462 4,506,172
466 4,506,173
490 4,506,174
525 4,506,175
557 4,506,176
602 4,506,177

CLASS 308

6 C 4,505,521
4,505,522

CLASS 310

41 4,506,178
91 4,506,179
4,506,180
156 4,506,181
193 4,506,182
306 4,506,183
328 4,506,184

CLASS 312

333 4,505,526

CLASS 313

113 4,506,185
129 4,506,186
341 4,506,187
405 4,506,188
493 4,506,189

CLASS 315

5.35 4,506,190
14 4,506,191
71 4,506,192
169.3 4,506,193
200 R 4,506,194
205 4,506,195
241 R 4,506,196

CLASS 318

34 4,506,197
301 4,506,198
313 4,506,199
493 4,506,200
603 4,506,201
4,506,202
624 4,506,203
653 4,506,204
4,506,205
696 4,506,206
4,506,207

CLASS 323

314 4,506,208

CLASS 324

57 R 4,506,209
66 4,506,210
72 4,506,211
73 AT 4,506,213
73 R 4,506,212
117 R 4,506,214
158 MG 4,506,218
158 P 4,506,215
166 4,506,216
208 4,506,217
221 4,506,219
252 4,506,220
256 4,506,221
309 4,506,222
4,506,223
319 4,506,224
334 4,506,225
459 4,506,226

CLASS 328

33 4,506,227

CLASS 329

107 4,506,228

CLASS 330

4.3 4,506,229
10 4,506,230
129 4,506,231

CLASS 331

16 4,506,232
17 4,506,233

CLASS 332

16 R 4,506,234

CLASS 333

12 4,506,235
19 4,506,236
28 R 4,506,237
138 4,506,238
196 4,506,239
202 4,506,240
222 4,506,241

CLASS 335

120 4,506,242
132 4,506,243
151 4,506,244
160 4,506,245
164 4,506,246
216 4,506,247

CLASS 336

233 4,506,248

CLASS 337

232 4,506,249

CLASS 338

5 4,506,250
238 4,506,251

CLASS 339

17 LM 4,505,527
4,505,528
17 M 4,505,529
38 4,505,530
64 R 4,505,531
75 M 4,505,532
198 R 4,505,533
263 R 4,505,534

CLASS 340

347 DA Re.31,850
347 DD 4,506,252
506 4,506,253
510 4,506,254
514 4,506,255
518 4,506,256
521 4,506,257
618 4,506,258

640 4,506,259
649 4,506,260
718 4,506,261
825.44 4,506,262
856 4,506,263

CLASS 343

8 Re.31,851
18 E 4,506,264
704 4,506,265
715 4,506,266
744 4,506,267
792.5 4,506,268
872 4,506,269
914 4,506,270
915 4,506,271

CLASS 346

76 PH 4,506,272
4,506,273
82 4,506,274
108 4,506,275
140 R 4,506,276
4,506,277
216 4,506,278

CLASS 350

1.3 4,505,535
3.64 4,505,536
3.71 4,505,537
96.15 4,505,539
96.20 4,505,540
96.23 4,505,541
96.33 4,505,542
96.34 4,505,543
162.13 4,505,544
321 4,505,545
334 4,505,546
339 R 4,505,547
346 4,505,548
349 4,505,549
357 4,505,538
372 4,505,550
384 4,505,551
392 4,505,552
414 4,505,553
518 4,505,554
527 4,505,555
532 4,505,556
536 4,505,557

CLASS 354

4 4,505,558
66 4,505,559
86 4,505,560
123 4,505,561
203 4,505,562
234.1 4,505,563
270 4,505,564
299 4,505,565
400 4,505,566
403 4,505,567
458 4,505,568

CLASS 355

3 DD 4,505,573
3 R 4,505,569
4,505,570
4,505,572
3 SH 4,505,571
14 E 4,505,574
4,505,575
14 R 4,505,576
15 4,505,577
43 4,505,578
53 4,505,580
55 4,505,579
58 4,505,581

CLASS 356

5 4,505,582
73 4,505,583
123 4,505,584
237 4,505,585
301 4,505,586
345 4,505,587
354 4,505,588
402 4,505,589
445 4,505,590

CLASS 357

23.11 4,506,279
36 4,506,280
43 4,506,281
4,506,282
51 4,506,283
52 4,506,284
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